Study
Report
2006-04

Evaluating the Contributions of Virtual Simulations to Combat Effectiveness

Phillip N. Jones and Thomas Mastaglio
MYMIC LLC

**United States Army Research Institute
for the Behavioral and Social Sciences**

March 2006

U.S. Army Research Institute
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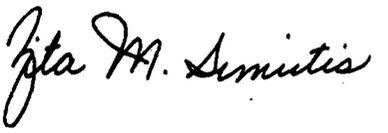

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REPORT DOCUMENTATION PAGE

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED (from. . . to)
March 2006	Final	March 2004 – September 2005

4. TITLE AND SUBTITLE	5a. CONTRACT OR GRANT NUMBER
Evaluating the Contributions of Virtual Simulations to Combat Effectiveness	W74V8H-04-C-0010

6. AUTHOR(S)	5b. PROGRAM ELEMENT NUMBER
Phillip N. Jones and Thomas W. Mastaglio (MYMIC LLC)	665803
	5c. PROJECT NUMBER: D730
	5d. TASK NUMBER: 305
	5e. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
MYMIC LLC 200 High Street, Suite 308 Portsmouth, VA 23704	

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. MONITOR ACRONYM
U.S. Army Research Institute for the Behavioral and Social Sciences ATTN: DAPE-ARI-IF 2511 Jefferson Davis Highway Arlington, VA 22202-3926	ARI
	11. MONITOR REPORT NUMBER: Study Report 2006-04

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES
Contracting Officer's Representative and Subject Matter POC: Stephen Goldberg

14. ABSTRACT
The problem under investigation was the evaluation of virtual simulations to combat effectiveness for two separate populations: US Army, heavy combat units returning from Operation Iraqi Freedom and US Army National Guard heavy combat units. The research used opinion data collected via questionnaires delivered to battalion through platoon leadership. Questionnaires were delivered via physical interviews and written survey and also through web delivered surveys. Individual opinions were aggregated based upon duty position and other demographic factors to develop collective opinions, which allowed analysts to make supported observations. Results are reported separately for Iraqi Freedom units and National Guard units. Significant findings include: virtual simulations are effective but are seen as a substitute to live training; users would prefer higher operational area modeling in virtual trainers so they can use them more as theater/mission rehearsal tools; and integration of virtual simulations into unit training strategies is a learned skill and requires more attention. Finally, this research demonstrates the viability of using web-based collection methods in further investigations.

15. SUBJECT TERMS
Close Combat Tactical Trainer

16. SECURITY CLASSIFICATION OF			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19. RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Ellen Kinzner Technical Publication Specialist (703) 602-8047
Unclassified	Unclassified	Unclassified	Unlimited	90	

Study Report 2006-04

Evaluating the Contributions of Virtual Simulations to Combat Effectiveness

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665803D730

Personnel and Training Analysis Activities

FOREWORD

The U.S. Army has made significant investments in virtual simulations for training its mechanized forces. The Close Combat Tactical Trainer (CCTT) has been fielded across the Active Army and a mobile version is available for National Guard armor and mechanized infantry units. The original virtual simulation, Simulation Networking (SIMNET) is still being used by National Guard units. An earlier research project summarized in a report entitled "Assessing the Effectiveness of the Close Combat Tactical Trainer," ARI Research Report 1820, January, 2004, obtained leaders' opinions about the contribution CCTT was making to their overall training strategy. The report also presented anecdotal information about unique training applications of CCTT.

This report summarizes two studies conducted to determine the contribution virtual simulations made toward preparing Active Component and National Guard units for deployment. The studies used many of the questionnaire items and survey methods developed in the earlier CCTT assessment project. The first study surveyed Active units upon their return from the early phases of Operation Iraqi Freedom regarding the role CCTT played in preparing them for combat operations. The second study focused on obtaining National Guard leaders' opinions regarding their use of virtual simulation (CCTT, Mobile CCTT, and SIMNET) as part of their preparation for deployment.

Both studies were part of the ARI studies program. Both topics were generated by the U.S. Army Training and Doctrine Command's Program Integration Office, Virtual Simulation (TPIO, Virtual). During the period when the studies were conducted TPIO, Virtual was directed by COL Mark Vinson and COL James Shufelt. The TPIO, Virtual representative who monitored progress of the work was Mr. Daniel Miller. TPIO, Virtual was briefed on the results of the studies on 22 September 2005 at Ft. Leavenworth, KS.

MICHELLE SAMS
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Acknowledgements

The authors of this report would like to thank Mr. Travis Cherry, whose time and expertise were essential in this work.

The authors would also like to thank Mr. Dan Miller and Mr. Randy Krug, whose assistance made the research possible.

Finally, the authors would especially like to thank the US Army professionals, those officers and noncommissioned officers who provided their honest and insightful opinions. It was a rewarding experience to work with them. The defense of the nation remains in good hands.

EVALUATING THE CONTRIBUTIONS OF VIRTUAL SIMULATIONS TO COMBAT EFFECTIVENESS

EXECUTIVE SUMMARY

Research Requirement:

The primary intent of this investigation was twofold. One portion of the investigation was designed to determine what role virtual simulations, which were developed to train collective task proficiency, played in preparing close combat units for operations in a combat theater, specifically Iraq. The other portion of the investigation examined the use of virtual simulations, as implemented in virtual maneuver trainers (e.g., Simulation Network (SIMNET) and Close Combat Tactical Trainer (CCTT), by Army National Guard (ARNG) units.

Procedure:

The method sampled the attitudes and opinions of the training devices user populations. This approach is based upon techniques and principles commonly used in the commercial world as the basis for customer relationship management strategies. User input, in juxtaposition with analyses of reported training system usage, was evaluated to address a set of investigation objectives from which we derived a primary set of investigation issues and sub-issues. A finding for each sub-issue was arrived at through an analysis of questions presented to specific categories of the user populations (e.g., Commanders, Company level leaders, Operations Officers, etc.). Issue findings are the aggregation of sub-issue findings determined through an analytic review process that begins with determining consensus responses for each question. Data was collected through written surveys, interviews with key leadership personnel, and web hosted questionnaires.

Findings:

A primary result of the first investigation effort was a finding that units used virtual simulations as a secondary training environment once they were alerted for deployment. Collective and individual training in live environments, using ranges, maneuver areas and mock MOUT sites, was given priority. Virtual training environments were used as an additional context for preparing units for deployment; they were primarily used for and by company level leaders as time permitted. Another factor contributing to the secondary role of CCTT was command emphasis on insuring individual Soldier skills (e.g., marksmanship, first aid, etc) were at peak levels of expertise and that family/personal matters were in order before deployment. An exception was a centralized approach used in USAREUR where each platoon being deployed was required to successfully complete a command prescribed set of scenarios in CCTT designed to exercise the tasks anticipated during combat operations. This CCTT exercise was part of a comprehensive tune-up for deployment that emphasized individual and platoon level proficiency. The reason for this approach being adopted in USAREUR was lack of suitable dessert-like terrain within that theater and the command's decision to insure that all of its units were prepared for combat at a minimal acceptable level of competency. Unit leaders in general perceive a key role in their collective training for the use of virtual simulations and those who have redeployed

from an operational theater would integrate CCTT into their preparations for future deployments given sufficient time. However, they strongly suggest that to do that they need CCTT to be directly relevant to any specific theater to which they might deploy; it should have appropriate terrain databases of that theater and Semi Automated Forces able to emulate tactics of possible enemies. Units are satisfied with the support provided by CCTT sites. They chose to train offensive scenarios and tasks at the company/troop and platoon levels relying heavily on the after action review (AAR) capability of the system and AAR process to reinforce learning and insure training objectives are met.

The second investigation found that, within the ARNG, training using virtual simulations is almost exclusively platoon level; this includes training at fixed sites, where available, as well as platoon configurations in the mobile trainers. ARNG unit leadership does not yet fully understand how to integrate virtual simulations into their overall training strategy, although they do appreciate the potential of virtual maneuver trainer (VMT's). Published usage guidance is almost non existent, a finding consistent with previous investigations of CCTT usage in the active force. Because many ARNG close combat units are either scheduled or expect to be scheduled for deployment to the Iraq Theater they have attitudes similar to their active counterparts about the relevance of currently available virtual environments. Unit leaders would like relevant terrain databases and semi-automated forces (SAF) in their VMT's in order to better prepare for the conditions and missions they expect to encounter. Access to VMT's is not an issue and ARNG appear satisfied with the current strategy of a higher level organization establishing a prescribed schedule for mobile trainers around which they plan their training. Although unit leaders would like to train at higher than platoon level in virtual simulations they are not sure that the technology can support them because the systems to which they are primarily exposed are platoon level (mobile) trainers. ARNG leaders hold opinions similar to the active component in regards to the fidelity of virtual simulations available to close combat forces; they perceive it as adequate with the exception of theater relevant capabilities. The highest priority for system enhancements is terrain and simulator realism, but not at the cost of reduced access to the system.

In general, these two efforts, in combination with a previous investigation of CCTT, point to a gradual cultural change within close combat heavy units to incorporate and depend on virtual simulations. This process is not as mature in the ARNG because they have not had access to virtual simulations for as long as active units and their training cycles stretch over longer periods of time because they are not full time Soldiers. We have termed this trend "cultural absorption" and although it continues, current operational conditions may be slowing its pace because of the emphasis on counter insurgency vice high intensity conflict. Junior leaders of today may have to be reindoctrinated at some future point in their professional training on the importance of maneuver warfare so the Army does not loose the capability to conduct such operations. Virtual simulations can play a key role in that process if employed and managed properly.

Utilization and Dissemination of Findings:

The findings of this report are useful to both training developers and training managers. Developers will discover specific recommendations from their user base for improving the effectiveness of their training devices, CCTT and SIMNET in particular and all training devices in general. Training developers can learn how users are, or are not, integrating virtual simulations into their training programs. Managers can take from this report targets for the commitment of resources to improve training programs and for educating leaders.

EVALUATING THE CONTRIBUTIONS OF VIRTUAL SIMULATIONS TO COMBAT EFFECTIVENESS

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Background

In April 2002, the Army Research Institute (ARI) and the Training and Doctrine Command (TRADOC) Program Integration Office-Virtual (TPIO-V) commissioned an investigation assessing the effectiveness of the Close Combat Tactical Trainer (CCTT) (Mastaglio, Peterson, Williams 2004). This investigation assessed general effectiveness of CCTT via a process of interviewing and surveying users, then consolidating their opinions to develop general user findings. This investigation sampled attitudes of battalion and below level leadership from four US Army battalions and two CCTT sites. Some of the investigation's findings were:

- CCTT fixed site facilities are being operated in accordance with established PM-CATT policies and prescribed procedures.

- Users assess CCTT as having a direct, positive impact on their combat readiness. Units consistently include CCTT training in their preparation for live training events and believe its use directly improves mission essential task list (METL) performance levels. Opinions vary by unit and grade as to whether key staff and chain of command oversight of the preparation for and execution of CCTT training exercises is sufficient.

- CCTT is being integrated into unit training strategies and plans as a key event, but is not given the same emphasis or as closely managed as field training. CCTT exercises are scheduled and planned well in advance. Either 9both in some cases) unit METL requirements or events they will encounter during upcoming live training are the basis fro selecting scenarios and exercise objectives. CCTT is used more in preparation for future events than as a context for remediation of deficiencies identified during live or other training.

- Company grade officers and NCOs are the prime users of CCTT, both because that is the way it is generally managed at the battalion level and because they have easy access to the site for their unit's use. CCTT exercises are primarily planned, conducted, and reviewed at company level. There are units that have active involvement of battalion staff and leaders, but these are the exception.

- Close combat unit leaders believe CCTT directly contributes to unit readiness and potentially reduces resource consumption. However, it is not feasible to develop specific metrics for value or cost effectiveness.

- All members of the chain of command rated the AAR capabilities in CCTT as critical to effective training.

- CCTT is being used at the company and platoon level extensively to prepare units for live fire table ranges.

- Users are satisfied with the fidelity of CCTT.

- Users desired the Army to procure more simulators to allow task force level training and to procure high mobility multi-wheeled vehicles (HMMWV) simulators to support scout training.

- There is no published training guidance at any level establishing usage levels or event-driven use of CCTT.

- Most company grade leaders use the outcomes of CCTT to plan future training.

The process provided sufficient insight for continued investigation, specifically evaluating the contribution of virtual simulations to units preparing for Operation Iraqi Freedom (OIF) and assessing training and leader development using mobile CCTT in the U.S. Army National Guard (ARNG).

The goals of this OIF investigation were:

- To determine if virtual training impacts combat effectiveness,

- To evaluate if changes should be made to the CCTT simulation or sites to better meet pre-deployment training needs.

The ARNG trains using a variety of simulators, including fixed and mobile CCTT and fixed and mobile SIMNET. Collectively these are call Virtual Maneuver Trainers (VMTs) and the investigation looked at these VMTs used by the ARNG.

The goals of the ARNG investigation were:

- Determine the training and leader development benefits of VMT used at ARNG home stations (pre-mobilization).

- Determine the generalization of skills learned in Virtual Close Combat simulators to combat systems and tasks that will be encountered in theater.

- Determine the functionality of Virtual Close Combat simulators, training approaches, and hardware configurations.

- Recommend changes in the way virtual close combat simulators are scheduled and utilized to potentially increase their efficiency and effectiveness.

As conducted, this investigation was actually comprised of two independent data collection and analyses:

1. The OIF investigation of the effectiveness of CCTT in helping prepare notified units for deployment.

2. The ARNG investigation of the effectiveness of VMTs during premobilization training.

This report addresses the two investigations separately.

The OIF investigation sample consisted of eight units who had returned from OIF. Some common characteristics about these units follow.

Upon receiving a deployment warning order, each of the units were in a different point of their training plan. One was preparing for the National Training Center. However, all would consider themselves trained and ready for Mission Essential Task List (METL) operations. During pre-deployment, these units anticipated offensive, METL-supported operations, as opposed to the stability and reconstruction operations (SARO)* they later found themselves performing in-theater.

There are two implications for the investigation. It was found that much of the training focus of these units shifted away from collective tasks, on which they considered themselves proficient, toward individual tasks, which they thought were important to Soldier survival, and on Soldier and family support tasks, anticipating the effects of deployment. These subtle changes impacted unit attitudes toward the use of CCTT after re-deployment.

The other implication is that, due to an operational level shift from offense to SARO, and resultant impacts on tactical tasks and order of battle, including switching from mechanized to motorized/dismounted operations, the tasks they trained in CCTT were frequently de-emphasized during OIF. This had obvious impact on the perceived effectiveness of CCTT in preparing these Soldiers for their operations in Iraq. Proving their professionalism, leaders who were interviewed and surveyed looked beyond this potential problem.

The ARNG sample consisted of battalions located within the United States. The National Guard Bureau (NGB) nominated battalions for the study. All sample battalions were in varying places in their training programs. However, they all shared common ARNG training conditions.

ARNG training is divided into pre- and postmobilization training. This investigation addressed exclusively premobilization training. The objective for ARNG units is "to identify achievable, sustainable training requirements, this provides the focus for effective premobilization unit training." The ARNG has established required premobilization training proficiencies, to include (FORSCOM/ARNG/USAR Regulation 350-2, 1999):

- Individual Soldier proficiency: Duty-Military Occupational Qualification (DMOSQ) and professional development at 85% of assigned strength,

* Note, on 14 June 2005, the US Army published a new version of FM 1 that changed the basic types of operations from offense, defense, stability, and support to offense, defense, stability and reconstruction, and civil support. As this change occurred during the final analysis and preparation of this report, readers will find both the old term stability and support operations (SASO) and the new stability and reconstruction operations (SARO).

- Maneuver (collective) proficiency: Infantry/Armor/Cavalry—platoon level,
- Crew/weapon system qualification/technical skills proficiency,
- Command and staff proficiency at level organized.

ARNG combat units are to focus on platoon maneuver and gunnery. In fact, platoon level proficiency is a gate, which must be reached before performing company level training. The decision of whether the gate has been reached lies with the brigade commander. Additionally, the ARNG as a whole has a requirement to annually conduct 280 platoon/company and 21 battalion virtual training cycles (FORSCOM/ARNG/USAR Regulation 350-2, 1999). However, there is no further requirement imposed on lower level units to conduct a specific number of these training events.

These conditions set specific VMT use guidance for the Guard and outline training management conditions for ARNG units: focus should be on individual skills, crew/weapon system qualification, command and staff proficiency, and maneuver up to platoon level.

Method

The OIF and ARNG investigations were each conducted in three phases:

- A preparatory phase involving the writing of a plan and the identification of available data, the development of the survey instruments, and the coordination with the investigation sites and units.
- A data collection phase during which a team visited sample units and delivered questionnaires through interviews and written surveys.
- A data analysis phase that compiled and studied the data collected in Phase 2 to generate appropriate findings, observations, and recommendations.

Preparatory Phase

For each investigation a formal research plan was developed and delivered to the government for review and approval.

Study goals were disaggregated through two levels. From investigation goals, the team developed specific investigation issues. Each of these issues was further separated into sub-issues, from which questions were developed.

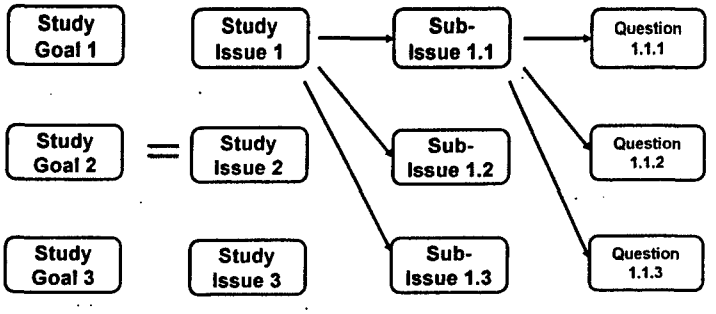

Figure 1. Investigation goal disaggregating

Simultaneously, the team identified a desired unit sample and the population of respondents from whom data would be collected using questionnaires and interviews. The unit sample was built in order to collect input from a variety of unit types and locations. The desired sample was delivered to the Government for populating. In both investigations, current unit Operations Tempo (OPTEMPO) and other factors prevented accessing an ideal population sample but nevertheless the sample did include sufficient depth to assure analytic insights would be representative of the Army as a whole.

For the OIF investigation, the intention was to include U.S. Army Europe (USAREUR) units in the sample. However, these units were not available and, instead, the team collected data from USAREUR training sites; this spawned a small sub-investigation effort which will be described separately in this report.

Figures 2 and 3 show geographically the population from which data was collected for each investigation:

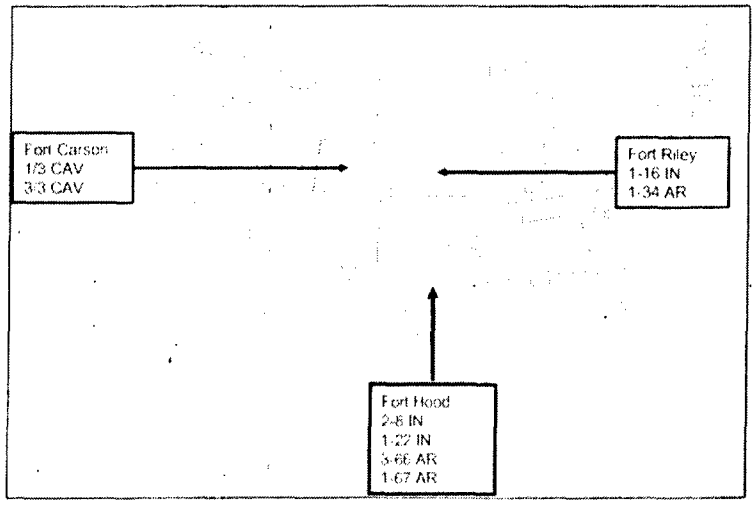

Figure 2. OIF investigation unit sample

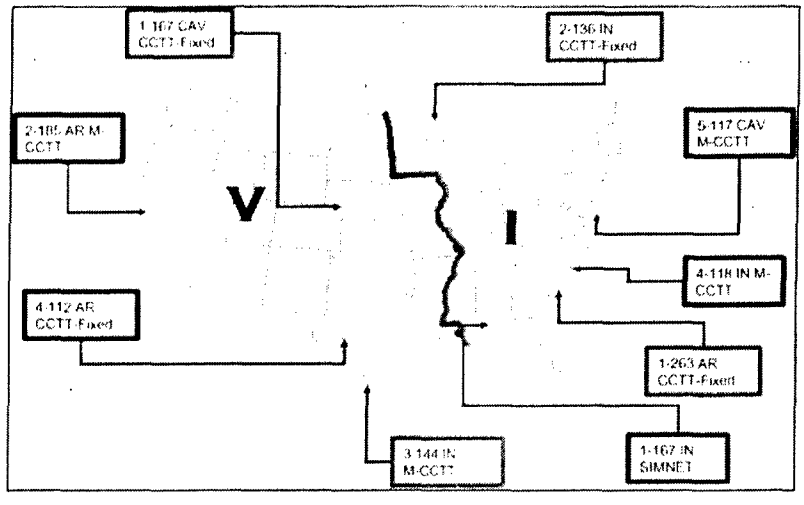

Figure 3. ARNG Investigation Unit Sample

For each investigation, a standard list of respondents by unit position was created. These were personnel who would likely have the knowledge being sought, both officer and NCO small unit leaders, from platoon to battalion level.

For the OIF investigation, it was decided to match the same list of respondents with the one used in the previous CCTT investigation: Battalion Commanders, Battalion Command Sergeant Majors (CSMs), Battalion Executive Officers (XOs), Battalion Operations Officers (S3s), Company Commanders, Platoon Leaders, and Platoon Sergeants. The only exception to the earlier respondent list is that Site Staff members were not included.

For the ARNG investigation, it was decided, after consultation with NGB to reduce the number of unit respondents. We did not collect input from Battalion XOs and interviewed Battalion Master Gunners in lieu of CSMs. In addition, in order to obtain a variety of opinions, the team decided to make an effort to collect input from members of the NGB's Distributed Battle Simulation Program, i.e. Training Aids, Devices, Simulators, and Simulations (TADSS) Facilitators and Commander's Operations Training Assistants (COTAs). The team also included active componentsAC Advisors to the ARNG and site staff supporting NGB training in the investigation population.

In the OIF investigation, there was one identified respondent demographic factor: duty position. In order to allow greater comparative analysis, the ARNG investigation included seven demographic factors:

- Duty Position
- Months in position
- Primary VMT
- Level of VMT experience
- Home State
- OIF Veteran
- Under orders for OIF

Questions were cross-referenced to the class of respondents who would reasonably have insight on the topic. Physical questionnaires were then prepared for each respondent within each sample unit.

Both investigations included web-collection of data as an additional or alternative means of acquiring input from the user community. This web-based approach was conducted as a test of the efficacy of using the web as a primary method for data collection in these types of investigations. The web-collection consisted of questionnaires delivered via a web site. Respondents were asked via the Army Knowledge On Line (AKO) web page and emails to visit a web site where they could complete the questionnaire. The OIF investigation web-collection was designed to serve as a proof of principle. The primary goals were to determine how to disseminate such an investigation, determine whether the target audience would voluntarily respond and whether their responses would suffice to provide sufficient data to conduct an analysis that answered the government's investigation goals. Maximizing web questionnaire response was emphasized. Thus, neither questionnaires nor respondents by position were explicitly matched between the physical and web-collections for the OIF investigation. The web-collection approach proved successful as an approach to soliciting input from a significant number of users.

Building on the success of the web effort for OIF in obtaining user input, we decided to make the ARNG web-collection effort mirror the physical collection effort by matching both the sample of respondents and questions posed using either approach. The only difference between physical and web-collection was that the web-collection effort asked for respondents who had served in the appropriate positions anytime in the last two years, whereas the physical collection could only collect data in actual units from respondents currently serving in the designated positions. For purposes of efficiency, only the web-

collection method was used to collect data from AC advisors, site staff, COTAs and TADSS facilitators.

Respondents on the web went through an informal, multi-level vetting process. The manner of announcement, via AKO home page announcement and targeted email, served as the first level of screening. At the next level respondent were forced to perform a self-screening. They first had to decide that they fit the announced survey criteria and go to the survey site. Once on the site, they had to complete a short demographic questionnaire. They were then given questionnaires targeted to their duty position. Anyone who responded, even if they did not pass the vetting process and qualify as part of our target population, was asked to complete an "other respondent" questionnaire. This is a recommended technique in order to avoid discouraging these particular volunteers from agreeing to participate in the future.

The final screening step was completed by a MYMIC Subject Matter Expert (SME) analyzing the data. The Analyst reviewed each answer to determine its validity to the question. Answers that did not follow from the question were not included in the analysis. When this occurred, the SME would also review that individual's entire questionnaire. Some questionnaires were obviously not submitted as serious responses so they were selectively removed from the database.

For each investigation, MySQL databases were developed for use as a repository for the results of all questionnaires. These databases are being delivered with the final report to the Government for use in future investigations or analysis's. In addition, Data Analysis Interface (DAI) tools were developed to assist MYMIC analyze the large amount of data collected via the web. The DAI toolset is also being delivered in the form of code to the Government for potential future use. This was not a formal deliverable and the scope of this investigation did not allow the development of complete documentation of the DAI. MYMIC intends to further develop this toolset for future corporate use.

Data Collection Phase

Teams visited each unit within the sample population. The team provided an in-briefing to battalion leadership. They then conducted interviews of available battalion level leaders and surveyed available company and platoon level leaders. The interviews consisted of prepared questionnaires, but included the opportunity for follow-up questions and discussion. Often the follow-up provided observations as useful as the formal questionnaire. These observations will be discussed at the end of this report.

An issue with the OIF physical collection effort was the turn-over of personnel within the targeted duty positions. Units were replacing key personnel almost immediately upon return from Iraq, before our team could visit. In the case of one battalion, the unit was literally unloading duffle bags from shipping containers during the visit, and even that unit had personnel turnover. Fortunately, in some cases, Majors who served as S3s during OIF had moved up to the XO position, in which case they were interviewed using the S3 questionnaire.

Web-collection occurred concurrently with unit visits to complete the physical collection.

It will be noted that for some respondent categories, there is a relatively small sample size compared to respondent populations. The research is not intended to determine the opinions of the various populations. Rather, the research uses consensus opinions that provide relative insight into the effectiveness of virtual simulations.

Data Analysis Phase

The final phase consisted of aggregating the data in a reversal of the earlier disaggregating process in Figure 1. As shown in Figure 4, within each investigation, OIF and ARNG, individual answers were combined into consensus answers for each question, by-position. These by-position consensus answers were then used to determine by-position, sub-issue findings. By-position, sub-issue findings were combined into general, sub-issue findings. Finally, general, sub-issue findings were used to derive issue findings.

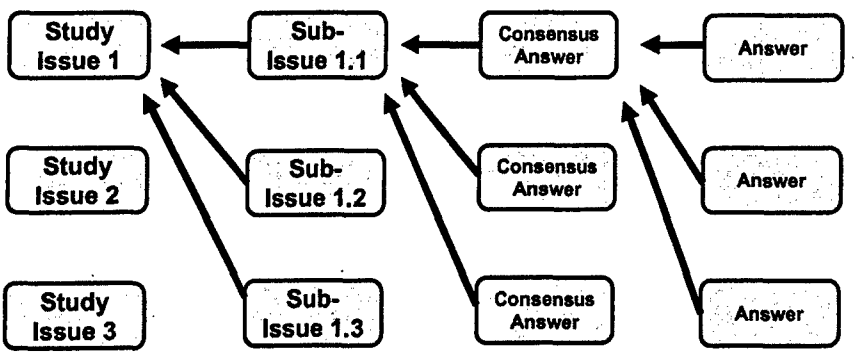

Figure 4. Investigation findings aggregation

In the OIF investigation, due to the asymmetry between physical and web-collection, the web collected data was aggregated to the by-position sub-issue finding level, but was not used to determine general sub-issue findings. Instead, the web results were analyzed separately to evaluate the viability of using the web to conduct similar investigation efforts in the future.

In the ARNG investigation, however, there was symmetry between the web physical and web-collections. Further, the web-collection effort was more successful and more informative than expected. Therefore, in order to provide the best investigation results, the web and physical collection efforts were combined at the by-position, sub-issue finding level to form general sub-issue findings.

The ARNG effort analysis consisted of two types of analysis. For quantitative questions, there was a statistical analysis. However, many of the questions were qualitative requiring short answers. These questions were reviewed by a MYMIC SME, who first screened the answers, then grouped them into categories in order to obtain a weighting of

respondent opinion. These weighting were then used to derive consensus answers. As an example, a question might ask, "What is the most significant limitation to using a VMT?" Within a respondent position, some individuals might have skipped the question completely. Other individuals might have provided an answer that did not relate directly to the question. Of the remaining individuals, some might have provided a single limitation. Others might have listed multiple limitations, with no indication as to which they believed to be the most significant.

Their answers were grouped and then added. Continuing with this example, there might have been sixteen answers referring to distance/location, eight referring to time availability, four referring to scheduling, etc. Our analysis process then determines that the user population believes distance/location is the most significant limitation to VMT use, followed by time availability etc. Further, one can compare the responses to see their relative strengths, i.e. in this example distance/location is not only the stronger answer but is cited twice as often as the next answer, sixteen references versus eight, inferring it is two times more important to the respondents as a sample of the population.

For select questions, additional relative analysis was conducted to determine differences between Fixed and Mobile VMT user opinions and differences between CCTT and SIMNET user opinions.

Macro Level Analysis (MALA)

Concurrent with data collection, the investigation team reviewed CCTT and SIMNET usage data provided by the government through their support contractor (Madison Research) for monitoring Contractor Logistics Support (CLS) at these sites. Our goal was to determine if any insights on preparation for deployment to Iraq or general ARNG usage could be inferred from a review of that reported data (e.g., did sites at installations deploying significant numbers of units to theater have an increase or decrease in usage between unit notifications and their deployment). Results of the two macro-level analysis (MALA) are listed in the section covering the findings specific to each of the two investigations.

Findings & Discussions

This section of the report provides the overall findings by research issue for each investigation: OIF and ARNG.

The section is divided into sections that present first OIF investigation findings and then the ARNG investigation findings. For each investigation, each issue and its related finding are shown, followed by sub-issues and overall sub-issue findings. For readers who want to see the input used to develop the overall sub-issue findings, Annex A and B list for each sub-issue; the same overall finding as contained in this section and the by-position, findings from which the overall finding was derived.

Each investigation had a physical and web-collection. In the OIF investigation, the web-collection data was developed to evaluate the practicality and validity of a web collection approach. Due to differences between the two approaches in terms of both questions and respondents, the web data was not specifically reviewed during the data analysis. In the ARNG investigation, however, the web-collection mirrored the physical and web-collected data. Therefore the web data set was considered during data analysis. That is, for each position, web and physical sub-issue findings were combined to generate general, sub-issue findings. In the ARNG annex, the by-position, sub-issue table shows first the finding from the physical collection effort and then the finding from the web collection effort. Consensus answers by position are delivered in electronic form in Parts II (OIF) and III (ARNG) of this report as word documents. This same data is also available in the MySQL database also delivered with this report. Electronic files of these products are being delivered due to their size, 250 pages.

After the findings for each effort, there is a general discussion, including observations made during data collection but outside of the formal issue-analysis-finding process.

OIF Study:

The purpose of the OIF investigation was to evaluate the contribution of virtual simulations to combat effectiveness. Data was collected using physical interviews and surveys of targeted units that were representative of the population of active duty units which deployed to and fought in Operation Iraqi Freedom. Additional data was collected via the web as a test of the potential for use of this approach in the future. Interviews and surveys were conducted between August and November, 2004. Below is the number of respondents for both the physical and web collection efforts:

Table 1. OIF Investigation Physical Collection Results

Unit	BN CDR	BN CSM	BN XO	BN S3	CO CDR	PLT LDR	PLT SGT	Total
2-8 IN	1	1		2	3	11	9	27
1-22 IN	1	1			1	3	3	9
3-66 AR	1	1	1	1	3	4	7	18
1-67 AR	1		1	1		1	2	6
1/3 CAV	1		1		3	10	12	27
3/3 CAV	1	1	1	1	4	11	11	30
1-16 IN	1	1		2	4	6	6	20
1-34 AR	1	1	1	1	2	6	8	20
Total	8	6	5	8	20	52	58	157

Table 2. OIF Investigation Web Collection Results

CO CDR	PLT LDR	PLT SGT	Total
102	114	31	247

Findings:

ISSUE 1: Do units alerted for deployment view virtual simulation-based training as a critical part of their preparation?

FINDING: Units alerted for deployment did consider virtual simulation-based training as a component of their training strategy, but not as a critical part of preparation for combat. They preferred to execute predeployment training in live environments. Virtual environment training was not explicitly included in predeployment training plans but when selected and used it was because of bottom-up decisions; CCTT training to prepare for war was predominantly scheduled, planned, and executed by company and platoon level leaders.

SUBISSUE 1.1: How was CCTT generally used in unit training prior to deployment notification?

FINDING: Pre-notification, CCTT training frequency varied from weekly to annually among unit. Tasks selected for training were predominantly offensive and defensive, rather than stability or support operations. CCTT training typically occurred at the company and platoon echelon. Training is METL-based because units believe CCTT enhances METL proficiency.

Position	Sub Issue Finding
Battalion Commander	Pre-notification CCTT followed no Army-wide pattern. There was no common frequency of use. 75% of battalion commanders trained typically CO/TRP echelon. Tasks trained included: attack, movement-to-contact, and defend. All the battalion commanders believed CCTT enhanced METL proficiency.
Battalion CSM	CSMs indicated no cross unit patterns in using CCTT. CCTT was used at the platoon and company level with no CSMs reporting battalion level training. Types of tasks varied from unit to unit. Frequency of training varied by battalion. All CSMs stated CCTT enhanced unit level METL.
Battalion XO	Use of CCTT varied widely by unit both in frequency, task, and echelon. Generally, units used CCTT for lower echelon, platoon and company training and trained both maneuver and gunnery tasks. All XOs believed CCTT was highly effective in enhancing unit METL proficiency.
S3	CCTT training varied by unit. Two S3s stated it was done quarterly and one monthly. 66% of S3s stated they typically conducted platoon echelon training and 33% stated company echelon training was typical. No S3 reported battalion level training. All S3s reported that CCTT enhanced unit METL proficiency.
Company Commander	Units varied greatly in frequency of CCTT use prior to notification, from monthly to annually. 86% of commanders believed CCTT enhanced METL proficiency.
Platoon Leader	CCTT frequency varied by unit, 32% stated quarterly, 28% reporting monthly. 87% of platoon leaders stated CCTT enhanced unit proficiency.
Platoon Sergeant	CCTT training frequency varied by unit. 34% reported quarterly use. 20% reported annual use and 17% each reported semi-annual and weekly. 73% of platoon sergeants stated CCTT enhanced METL proficiency.

SUBISSUE 1.2: Did unit develop a focused or specific training strategy as part of preparation for deployment?

FINDING: Most units developed a pre-deployment training strategy. This strategy was focused at lower echelon units and individual skills. Units selected mostly offensive tasks, especially movement to contact. Most units included gunnery training.

Position	Sub Issue Finding
Battalion Commander	80% of battalion commanders reported executing a deployment specific training strategy. These strategies focused on lower echelon skills: platoon and some company. 50% focused on collective skills and 50% on individual skills. 50% of the battalions included gunnery training, including one battalion that used CCTT as part of gunnery. All the battalions reported company and platoon leadership requesting CCTT time as part of deployment training. All the battalions reported successfully complying with their training strategy.

Battalion CSM	83% of CSMs reported their units developing a pre-deployment specific training strategy. This strategy was focused at the lowest levels: individual and platoon collective tasks. 67% of CSMs reported that junior leadership, platoon leaders, and company commanders personally requested CCTT training time.
Battalion XO	50% of units developed a pre-deployment specific training strategy. This consisted of offensive and defensive operations. Company level leadership requested CCTT as part of this training strategy.
S3	67% of units developed a pre-deployment specific training strategy. This strategy consisted of maneuver and gunnery tasks trained at the platoon and crew level. Company commanders and platoon leaders requested CCTT access as part of this strategy. All S3s reported that their unit was able to comply with their strategy.
Company Commander	67% of company commanders stated their units developed a pre-deployment specific training strategy. Most units trained at the lowest echelon, individual and small units. Tasks were mostly offensive with some SASO and defensive. Many units trained gunnery or small arms. All responding commanders stated they were able to comply with their strategy, with some difficulties.
Platoon Leader	74% of platoon leaders reported that their unit followed a pre-deployment training strategy.

SUBISSUE 1.3: What live training was conducted to prepare for combat operations?

FINDING: Pre-deployment training consisted mostly (>50%) of live training—primarily on offensive tasks. Most live training was conducted at platoon level. Units used a variety of live-training venues: field training areas, ranges, sand tables, and formal and ad hoc MOUT sites.

Position	Sub Issue Finding
Battalion Commander	All battalions included live training in their deployment training plan. 100% of battalions trained offensive tasks and 66% trained defensive tasks. Only one battalion trained SASO tasks. Live training was multi-echelon focused on lower echelons: crew, platoon and company. Only one battalion conducted battalion level training. Battalions used a variety of training environments, including training areas, ranges, sand tables, and even abandoned buildings.
Battalion CSM	The majority of CSMs reported that live training consisted of over 30% of pre-deployment preparation with two reporting the total to be over 50%. 50% stated they typically trained at platoon level with 37% stating they trained at company and 13% reporting crew level training. Reported resources included MOUT sites and gunnery ranges.
Battalion XO	All XOs reported over 50% of their pre-deployment training being conducted in the live environment. This training was done at the company/troop level and consisted of a variety of tasks, with emphasis on gunnery.
S3	Over 50% of pre-deployment training was conducted in a live environment. This training was conducted at a variety of echelons but typically at platoon level. Units trained C2, maneuver, and gunnery tasks. Resources used included sand tables, maneuver areas and ranges.
Company Commander	86% of company commanders stated their unit included live training as a component of pre-deployment training. Over 50% of combat training was conducted in the live environment. Live training consisted of lower echelon units, company and platoon, conducting a variety of tasks, including maneuver, gunnery, and C2 tasks on ranges and in training areas.
Platoon Leader	96% of platoon leaders reported that live training was part of their pre-deployment training. This training included gunnery and offensive maneuver tasks. Only one respondent indicated a stability task. Units trained in maneuver areas and on ranges, with a few using sand tables.

Platoon Sergeant	87% of platoon sergeants reported doing live training as part of pre-deployment training. Gunnery was a predominant task, followed by maneuver training. Units used ranges, field sites, sand tables and a few units used MOUT sights.

SUBISSUE 1.4: Were virtual training events scheduled to prepare units for combat operations?

FINDING: Units conducted CCTT training during pre-deployment, but it was not a formal or mandatory part of a training strategy. Units used CCTT to train at the platoon echelon on combat tasks. Less than 10% of pre-deployment training occurred in CCTT. 60-70% of units used CCTT after their vehicles were shipped. (NOTE: See discussion on USAREUR for the exception to this finding)

Position	Sub Issue Finding
Battalion Commander	All battalions conducted CCTT events as part of pre-deployment training. No battalion incorporated CCTT within their training strategy nor prescribed a minimum of CCTT use. Half of the battalions reported CCTT as consisting of less than 30% of training while the other half reported it being less than 10%. 80-100% of tasks trained were combat versus SASO tasks. 60% of the battalion used CCTT to train following vehicle shipping.
Battalion CSM	83% of CSMs reported using CCTT as part of pre-deployment training. CSMs reported training echelon was typically platoon or company level, with no reports of crew or battalion. All CSMs reported that offensive and defensive tasks consisted of over 60% of pre-deployment training with 40% reporting over 80%. There was no consistent answer on how much of these tasks were conducted in CCTT, with answers varying from 10 to greater that 50%. 67% of CSMs reported using CCTT after vehicles were shipped. Only one CSM said his HQ required CCTT training as part of pre-deployment training.
Battalion XO	All units reported using CCTT as part of their pre-deployment training. CCTT was used equally at the platoon and company levels. 75% of XOs reported using CCTT after their vehicles were shipped. No HQ required a minimal CCTT use.
S3	40-60% of pre-deployment training was conducted on offensive and defensive tasks. However, only half of units integrated CCTT into their strategy and CCTT comprised less than 10% of this training. No HQ prescribed CCTT training. Only half of units used CCTT after their vehicles were shipped.
Company Commander	57% of commanders stated CCTT was part of their pre-deployment training. 45% of company commanders stated they typically conducted platoon echelon training and 38% stated they conducted company echelon training. 60-80% of tasks were combat related but less than 10% of training was conducted in CCTT. There was no effort at battalion to develop CCTT-specific training nor did the chain of command require a minimum, CCTT usage.
Platoon Leader	77% of platoon leaders reported using CCTT as part of their pre-deployment training strategy while just 58% reported using it after their vehicles were shipped.
Platoon Sergeant	52% of platoon sergeants reported using CCTT as part of pre-deployment training. 39% reported using CCTT after their vehicles were shipped.

ISSUE 2: As currently configured and managed, did CCTT sites adequately meet the needs of deploying units?

FINDING: CCTT site configuration and management more than adequately met the needs of deploying units. CCTT was available when needed by deploying units. Users

felt CCTT training was highly effective in training collective tasks; not as effective in training individual tasks. CCTT sites made changes to their operating procedures to better accommodate deploying units.

SUBISSUE 2.1: Was CCTT available when deploying units needed it?

FINDING: CCTT was available to support pre-deployment training. Less than 10% reported training lost due to non-availability. CCTT was not considered important to completion of unit training strategy.

Position	Sub Issue Finding
Battalion Commander	All battalions reported CCTT being available to support their training requirements. One reported difficulty scheduling it. One battalion reported CCTT availability as being important compared to other training resources.
Battalion CSM	CSMs reported CCTT was available when required. 33% reporting difficultly scheduling it. Only one CSM stated his unit had to cancel training due to CCTT non-availability.
Battalion XO	Only one XO reported CCTT not being available when needed, this due to scheduling conflicts. No unit had to cancel training due to non-availability.
S3	83% of S3s stated CCTT was available when needed. When it was not available it was due to scheduling conflicts. On a scale of one to five, S3s stated CCTT availability importance averaged 2.6. No S3 giving it a five.
Company Commander	CCTT was available when deploying units required it, leading to no inability to train. CCTT availability was only moderately important compared to other resources, a 2.2 on a one to five scale.
Platoon Leader	91% of platoon leaders reported CCTT was available when needed to support their pre-deployment training. 9% of platoon leaders reported training lost due to availability.

SUBISSUE 2.2: Were any changes to site operations made to accommodate needs of deploying units?

FINDING: CCTT sites made changes to support pre-deployment training. CCTT was available to support pre-deployment training.

Position	Sub Issue Finding
Battalion Commander	80% of battalion commanders reported CCTT sites made changes to accommodate pre-deployment training requirements. All commanders reported CCTT was available as needed to support training requirements. 60% of commanders reported participating in this training.
Battalion CSM	All CSMs stated CCTT availability supported preparation for deployment. 67% of CSMs participated in CCTT training during pre-deployment. This participation varied from mentoring more junior NCOs to participating in a squadron level exercise.
Battalion XO	All XOs reported that CCTT availability supported their preparation for deployment. 75% of XOs participated in CCTT training to improve crew level skills.
S3	67% of S3s reported changes made at CCTT sites to accommodate pre-deployment training. This includes a site making space available for bn level elements. All S3s report CCTT availability supported preparation for deployment. Half of S3s participated in CCTT training.

Company Commander	67% of company commanders reported changes made to site operations to support pre-deployment training. 76% reported that CCTT availability supported unit preparation.
Platoon Leader	83% of platoon leaders reported that CCTT availability supported their preparation for deployment.
Platoon Sergeant	61% of platoon sergeants stated that CCTT availability supported their preparation for deployment.

SUBISSUE 2.3: CCTT Training Effectiveness

FINDING: All respondents felt CCTT had a strong, positive impact training collective tasks, i.e. crew and unit level. Only platoon sergeants felt it had a positive impact on individual training. No position felt they would consider their unit "trained" based solely on CCTT results. CCTT is not considered a substitute for live training, due to CCTT's relative inability to model the difficulties of combat conditions.

Position	Sub Issue Finding
Battalion Commander	All battalion commanders reported CCTT being extremely effective, a five on a scale of one to five, effective at training collective tasks, i.e. crews and units. 60% reported it being effective training individuals. No battalion commander would consider being trained to standard based solely on CCTT. They believed CCTT was not able to adequately replicate combat conditions, as opposed to live training. All battalion commanders felt there was an established set of tasks for which CCTT could train units.
S3	No S3 has ever considered a unit trained to standard bases solely on CCTT due to the inability of CCTT to sufficiently replicate combat conditions. S3s felt that CCTT very positively impacts training proficiency for crews and units but believed there is very little impact on individuals. No S3 experienced negative training from CCTT. All S3s had an established set of tasks which are trainable on CCTT.
Company Commander	Company commanders would not consider their unit trained based solely upon CCTT due to the level of difference between CCTT and combat conditions. No commander felt CCTT caused negative training at the crew or unit level; 5% felt it caused negative training at the individual level. 90% of commanders felt CCTT had positive impact on crew training, with the majority saying it had extremely positive impact. 95% of commanders said CCTT had positive impact on unit proficiency, but there was no majority saying it had an extremely positive impact. Only 80% of commanders stated CCTT had a positive impact on individual training, but the majority of these gave it the highest positive impact rating. 71% stated they had seen no negative impact from CCTT on unit readiness. 90% of company commanders said there was an established set of tasks which CCTT can train.
Platoon Leader	83% of platoon leaders have never considered their unit trained based exclusively on CCTT training, due to the inability of CCTT to replicate combat conditions. 17% did feel there were tasks on which they could train their units to standard exclusively in CCTT. Platoon leaders overwhelmingly believed CCTT had a positive impact on individual, crew, and unit proficiency. No platoon leaders felt CCTT had a negative training impact on crews or units though 4% felt it had a negative impact on individuals. 83% stated there was an established set of tasks which CCTT can train.

Platoon Sergeant	82% of platoon sergeants stated they would not consider their unit trained based solely on CCTT results. CCTT realism cannot match combat conditions. 5% of platoon sergeants felt that CCTT had some negative impact on individuals, though no platoon sergeant felt it had any negative impact on crew or unit proficiency. Platoon sergeants felt CCTT had a positive or extremely positive impact on individual (67%), crew (79%), and unit (75%). 21% of platoon sergeants stated they have experienced some negative impact from CCTT. 85% of platoon sergeants reported that there was an established set of tasks for CCTT.

ISSUE 3: What type of predeployment training was conducted in CCTT?

FINDING: Units used CCTT to train offensive tasks from their METL. Training occurred at the company/troop echelon with significant platoon echelon training. Company commanders primarily managed training. AARs were critical to successful training. Study respondents reported their AARs being facilitated at the level of the echelon being trained, i.e. platoons facilitated platoon AARs, companies facilitated company AARs. Site staff provided OPFOR. CCTT SAF tactics did not match Iraqi tactics, techniques, and procedures.

SUBISSUE 3.1: How was CCTT training constructed?

FINDING: Units trained critical tasks, chosen primarily from their METL, but in some cases selected from command guidance or OPLANs. Units trained mostly offensive tasks. Units used CCTT to train both maneuver and gunnery skills. Use of TSPs varied by unit.

Position	Sub Issue Finding
Battalion Commander	All tasks trained were METL tasks. Half of battalion commanders stated METL was the starting point for CCTT planning, while 25% said commander's guidance and OPLANs. There was no consensus on how tasks or scenarios were selected.
Battalion CSM	There was no CSM consensus on how CCTT training was constructed. Units varied between gunnery and maneuver and between TSPs, in-house scenarios, and NTC scenarios.
Battalion XO	Units used CCTT to train a variety of tasks, including offensive tasks and gunnery.
S3	The starting point for CCTT training was unit METL. Units selected tasks they thought would support anticipated theater operations. Tasks included offensive tasks, and gunnery. Tasks were selected to create complex and challenging training. Half of units used TSPs.
Company Commander	CCTT strategy varied widely between units. Task selection and scenarios came from METL, command guidance, and OPLANs. Most tasks were offensive tasks, with movement to contact being somewhat common. Units also trained defensive tasks but not stability or support tasks. 71% of company commanders reported using TSPs to develop pre-deployment CCTT training.
Platoon Leader	Platoon leaders reported that command guidance was generally the start of exercise preparation, with some reporting METL or orders. Units varied greatly on the types of scenarios but most reported offensive scenarios, specifically movement to contact and gunnery. Only one platoon leader reported using a scenario generated by CCTT.
Platoon Sergeant	Platoon sergeants reported that their units trained collective, offensive tasks, mostly movement-to-contact. Almost exclusively, units generated their own scenarios.

SUBISSUE 3.2: What levels of exercises were conducted in CCTT?

FINDING: In similarity to units' overall pre-deployment training strategies, CCTT training occurred primarily at the Company/Troop level, with less but still significant platoon level training. Only a few respondents reported battalion level training.

Position	Sub Issue Finding
Battalion Commander	Battalion commanders reported CO/TRP training in CCTT.
S3	Units conducted training at platoon, company and battalion echelon. Tasks were offensive tasks such as deliberate attack, movement to contact, and react to contact. Tasks also included gunnery.
Company Commander	Typical echelon of training varied by unit, with company/troop being the most common, while several units reported platoon training being typical and a few reporting battalion level. Most units trained offensive tasks and gunnery. Some trained defensive tasks. Only one commander reported training SASO.
Platoon Leader	Platoon leaders reported the echelon of training evenly divided between company and platoon. Platoon trained maneuver, gunner and C2. Almost all platoon leaders reported performing offensive tasks, specifically movement-to-contact.
Platoon Sergeant	Platoon sergeants divided evenly between training typically platoon and company level tasks. The majority of platoon sergeants trained maneuver tasks, with approximately half of platoon sergeants training gunnery tasks and less than half training command and control tasks.

SUBISSUE 3.3: Who in the chain of command served as the on-site trainer during exercises?

FINDING: The primary facilitator of CCTT training were company commanders, with support from battalion. This was especially true for platoon level training.

Position	Sub Issue Finding
Battalion Commander	Battalion commanders stated that company commanders were the on-site trainers during CCTT exercises, with company commanders planning and supervising training.
S3	The S3 planned company level training. The S3 planned platoon level training with company commander input in some units.
Company Commander	Platoon level training was typically facilitated by company commanders with support from battalion. Company level facilitation was evenly divided between company and battalion.

SUBISSUE 3.4: After Action Reviews

FINDING: All respondents believed that AARs are critical or extremely critical to CCTT training success. Respondents varied greatly on who facilitated AARs, with respondents from the three echelons, battalion, company, and platoon, stating they facilitated platoon and, especially, company AARs.

Position	Sub Issue Finding
Battalion Commander	AARs are extremely, five on a scale of one to five, critical to a successful CCTT exercise. Half of battalion commanders stated they facilitated company level AARs with the other half saying company commanders or company trainers facilitated them. Only one battalion commander claimed he facilitated platoon level AARs while the majority of commanders stated company commanders facilitated them.
Battalion CSM	All CSMs reported that AARs were extremely critical to CCTT effectiveness.
Battalion XO	XOs considered the AAR capability to be very critical to CCTT effectiveness.
S3	S3s reported that AARs were critical to a successful CCTT exercise. Company commanders facilitated AARs at the company and platoon level with some units using battalion level leadership to facilitate company and platoon AARs and one unit using platoon leadership to facilitate platoon AARs.
Company Commander	Company commanders believed AARs were extremely critical to CCTT success. The vast majority of company commanders stated they facilitated their own AARs, with a small minority stating battalion facilitated them. One-fourth of commanders reported platoon leadership facilitating platoon AARs. The remaining commanders stated they facilitated those AARs, with a small number reporting some battalion assistance.
Platoon Leader	Platoon leaders believed the AAR is very critical to a successful CCTT exercise. Platoon AARs are typically facilitated by platoon leadership. 40% of platoon leaders stated company leadership facilitated all or some AARs and 14% stated site staff were facilitators.
Platoon Sergeant	48% of sergeants felt that AARs were extremely critical (5) and 27% felt they were critical (4).

SUBISSUE 3.5: How was the OPFOR played during exercises?

FINDING: Site staff played the OPFOR. Respondents were consistent in stating that CCTT OPFOR tactics did not match OPFOR tactics in Iraq.

Position	Sub Issue Finding
Battalion Commander	All battalion commanders stated that the site staff played the OPFOR.
S3	Site staff played OPFOR in all units.
Company Commander	Site staff played the OPFOR. Commanders reported that the ROE used in CCTT was dissimilar to that used in Iraq (average of 2 on a 1-5 scale).
Platoon Leader	Site staff played the OPFOR. Only 7% of platoon leaders found the CCTT ROE to be similar to what they experienced in Iraq.
Platoon Sergeant	Platoon sergeants reported that the site staff played OPFOR. Platoon sergeants stated that the CCTT ROE was not similar to the ROE in Iraq.

ISSUE 4: How does training in CCTT environment compare with actual combat?

FINDING: Generally, the CCTT training environment is sufficient to provide adequate training, but improvements are desired to better model current theater conditions and improve focused training support to deploying units. Units would like to have a capability that is short of mission rehearsal, but more specific to the theater than the CCTT Terrain Databases and SAF capabilities provided at the time they were preparing to deploy. The lower the echelon, the less satisfaction there was with current models of terrain, vehicle systems, weapons, and OPFOR tactics. Users especially desire a better OPFOR. Users also desire improved models of environmental conditions, such as theater specific MOUT

terrain and civilians-on-the-battlefield (COBs). There were no tasks that users felt could only be trained in CCTT. CCTT's strength, however, is its ability to replicate task conditions in support of multiple training iterations.

SUBISSUE 4.1: Did the CCTT Terrain Databases provide a context that was sufficient to practice under combat conditions?

FINDING: Users believed CCTT terrain realism was sufficient to support training. The lower the echelon (battalion-company-platoon), the less the respondent felt that the CCTT database modeled actual conditions sufficiently to support theater-specific training. Users wanted to see more theater-specific terrain modeling, in the case of OIF this included urban terrain and deserts. Users also recommended non-terrain improvements, specifically adding civilians to the environment and more accurate enemy TTPs.

Position	Sub Issue Finding
Battalion Commander	All battalion commanders reported that the CCTT terrain databases were realistic enough to support training requirements.
S3	All S3s felt that CCTT databases were realistic enough to meet training requirements and adequately prepare units for OIF.
Company Commander	76% of company commanders felt that the CCTT terrain databases adequately modeled conditions in Iraq and prepared them for combat operations. Commanders recommended better modeling the terrain for theater conditions, specifically desert and urban environments. Commanders would like to see more civilians, ambush sites, religious sites, walls, villages, palm groves, and enemy IED tactics.
Platoon Leader	64% of platoon leaders felt the CCTT terrain database adequately prepared them for Iraq. 57% felt the CCTT terrain was sufficiently realistic to support training, though 81% felt the training databases were realistic enough to meet training needs. Platoon leaders recommended improving urban terrain and civilian presence.
Platoon Sergeant	74% of platoon sergeants stated CCTT databases supported training. Half felt that the CCTT terrain database was neither adequate for training nor replicated terrain in Iraq. Platoon sergeants wanted more complex terrain, especially urban terrain, though there were also mentions of desert, rivers, roads, and bridges.

SUBISSUE 4.2: Was the CCTT OPFOR comparable to enemy fighting units encountered in theater?

FINDING: Battalion respondents (commanders and S3s) believed CCTT OPFOR was comparable to Iraqi OPFOR. Company and below respondents stated CCTT did not adequately model the Iraqi insurgent enemy and its tactics. Respondents want CCTT to model the specific OPFOR tactics they would face in-theater. In the case of OIF, these included such tactics as IEDs, VBIEDs, snipers, mortars, hit & run tactics, low density attacks, 360 degree engagements, and mixing with civilians. Again, respondents mention civilians on the battlefield, including such implications as traffic.

Position	Sub Issue Finding
Battalion Commander	All battalion commanders believed that CCTT OPFOR was comparable to Iraqi fighting units, though one commander recommended adding insurgents to the OPFOR.

S3	All S3s felt the CCTT OPFOR was comparable to units encountered in Iraq.
Company Commander	Company commanders would modify CCTT to better replicate insurgent tactics. Only half of commanders thought CCTT adequately modeled their opponents in Iraq. Their actual opponents used insurgent tactics versus conventional. Commanders would like to see smaller unit engagements on non-contiguous battlefields. They want to see dismounts using RPGs, IEDs, civilians, and insurgents in civilian attire.
Platoon Leader	Platoon leaders divided almost exactly in half over whether CCTT OPFOR was comparable to actual OPFOR. Platoon leaders said Iraqi OPFOR used insurgent tactics such as ambushes, IEDs, and snipers. Iraqi OPFOR was mixed-in with civilians and used trucks and other POVs. The Iraqis were much less accurate in direct fire attacks. They recommended more urban environments, more insurgent OPFOR, and multi-directional enemy attacks.
Platoon Sergeant	Almost all platoon sergeants stated the CCTT OPFOR did not adequately model the insurgents they faced in Iraq, in such areas as lack of organizational structure, lack of uniforms, dismounted tactics, and hit and run tactics. Just over half of platoon sergeants felt the differences between CCTT and Iraq were significant enough to state that CCTT did not adequately model OPFOR. The sergeants recommended building dismounted insurgents and insurgent tactics into CCTT. This included IEDs, suicide bombers, mortars, and mines. Platoon sergeants also focused on including civilians and civilian vehicles.

SUBISSUE 4.3: Were CCTT models of simulator characteristics comparable to actual combat performance?

FINDING: Majorities of all users felt CCTT adequately modeled weapon system combat performance. Some users said actual weapons performed better in combat than modeled in CCTT. Additionally, some report enemy weapon systems, specifically RPGs, operated better in CCTT than in combat. Users had several recommendations for improvement. Some include improving the M1A1's loader position to allow M240 engagements and to better model main gun loading. Users want better dismounted capability. Users also want HMMWV simulators. Users wanted CCTT to input vehicle degradation, either due to maintenance or weapon breakdowns or degradation to communications due to terrain (urban) masking.

Position	Sub Issue Finding
Battalion Commander	Battalion commanders believed that CCTT adequately modeled actual weapon systems both in operation, weapon effects, and movement. One commander felt CCTT did not adequately model weapon effects in an urban environment. Commanders jumped out of the physical modeling area to propose changes to environment modeling. These changes all involved making CCTT experience more aligned with Current Operational Environment (COE) conditions, including Enemy, Terrain, and Civilians from the METT-TC. Commanders wanted additional systems modeled, specifically gun mounted HMMWVs. One commander wanted a system that expanded the virtual environment to allow off-vehicle actions.
Battalion XO	One XO felt that communications capabilities within CCTT were better than realized in combat.
S3	All S3s felt that CCTT accurately and sufficiently modeled actual equipment performance. S3s had many recommendations for improvements. These include improvements in terrain databases: MOUT, higher fidelity, COBs. These also include better SAF. OPFOR SAF should better replicate actual OPFOR TTP, including IEDs. Friendly SAF should improve tethered vehicles and tethered dismounts.

Company Commander	Company commanders felt CCTT modeled well actual weapon, maneuver, configuration, communication and other operational combat performance. Areas commanders said were different was that CCTT had more limited visibility and that CCTT did not replicate communication troubles caused by breakdown or terrain (urban) masking. Commanders recommended more vehicle modeling, including civilian vehicles and HMMWVs. Commanders also recommended modeling wind effects and insurgent hide positions
Platoon Leader	Platoon leaders felt CCTT adequately modeled actual weapon (81%), movement (72%), and configuration (79%) effects. Platoon leaders recommended several changes, including: allowing the crew to fire from outside hatches (including the tank's loader's machine gun), creating more noise including bullet and RPG hits, modeling breach recoil, turret traverse in relationship to the hull, and loading and/or un-jamming weapons. Platoon leaders said they could travel in reverse in combat much faster than in CCTT. They said urban terrain and noise degraded communications in combat. Platoon leaders wanted to see more distracters, such as civilians, mosques, and cars.
Platoon Sergeant	Majorities of platoon sergeants believed CCTT adequately modeled actual combat performance, including weapon effects (80%), movement (60%), operational characteristics (67%), and communications (73%). Differences include: RPGs were more effective in CCTT, CCTT required too many MRS updates, CCTT had to have better tank loader station modeling including using the M240 and loading main gun rounds, CCTT weapons were too accurate, HEAT and AP round effects were less in CCTT, the M2/3 handled better in combat, vehicles were much hotter in combat, and CCTT fields of view were too restrictive. Several platoon sergeants reported that combat communications were better than CCTT communications, though two reported the opposite. However, only a few platoon sergeants made recommendations to change equipment representations. These included recommendation to improve the communications within CCTT and two recommendations to add a loader's M240. Rather than changing equipment modeling, most platoon sergeants took the opportunity to recommend changes to OPFOR/civilian modeling. These included introduction of aggressive theater-insurgent tactics (IEDs, VBIEDs, snipers, mortars, mines, shooting from civilian crowds, and close-in engagements of 300-600 meters). Platoon sergeants also recommended more urban terrain, civilians and civilian vehicles including civilian interaction, HMMWVs and AT-4s.

SUBISSUE 4.4: What were the most significant unexpected conditions encountered in combat for which training had not prepared units?

FINDING: All respondents overwhelmingly identified OPFOR tactics as the most unexpected condition faced in Iraq. Users wanted CCTT to better model theater insurgent tactics. Company grade respondents also mentioned unexpected terrain conditions. Battalion level respondents did not. S3s had the most specific comments, including comments referencing operational conditions such as rapid task organizing, non-linear fights, crowd control, and including training combat support and service-support Soldiers.

Position	Sub Issue Finding
Battalion Commander	Commanders stated the most significant unexpected condition encountered was insurgent TTP. Commanders also wanted better theater specific replication, including terrain (MOUT), civilians, non-linear engagements (360 degree battlefield). Commanders recommended dynamic terrain...terrain that changed due to unit actions, such as collapsed buildings.

Battalion CSM	CSMs desired a more accurate replication of operational conditions, including terrain (MOUT and COBs) and OPFOR TTP. Other suggestions included better dismounted operations, air-ground operations, checkpoint and road block operations, and integrating individual MILES into CCTT to allow individual crew casualties.
Battalion XO	XOs felt that the most unexpected conditions in combat dealt with insurgent tactics, including IEDs, mortars, and small arms engagements within MOUT conditions. XOs recommended adding IEDs to CCTT, more incoming mortar events, especially on stationary units, and MOUT databases including civilians.
S3	Soldiers were initially hesitant to pull their triggers. Units were not prepared to recognize IEDs, crowd control and reacting to fire from crowds. Quick task organizing. S3s recommended training for IEDs, training in a three dimensional environment, more theater specific scenarios, and the ability to train CS and CSS troops in combat operations.
Company Commander	Company Commanders identified several unexpected conditions. In the area of environment, these included the level of urbanization, restrictive terrain, city noises, civilians and civilian traffic. In the area of tactics: insurgent tactics including IEDs, hit and run attacks, no organized resistance. Commanders also did not expect to task organize from mechanized to motorized formations and to conduct SASO.
Platoon Leader	Unexpected conditions platoon leaders found included dismounted operations, MOUT, fighting unconventional tactics including IEDs, RPG ambushes and mines, and dealing with civilians.
Platoon Sergeant	Platoon sergeants again discussed unexpected insurgent tactics, including IEDs, VBIEDs, mines, mortars and snipers. They also reported unexpected environmental conditions, including urban terrain, civilians, restricted roads, and rough terrain. They recommended more dismounted operations, more checkpoint operations, and CASEVAC training.

SUBISSUE 4.5: Did CCTT prepare units for blue-on-blue encounters?

FINDING: All units reported some though few fratricide incidents. All incidents arose from difficult situational awareness in tactically and environmentally complex conditions, specifically engagements between units not fully aware of each other's presence or operations. Respondents stated CCTT helped in preventing more fratricide incidents. However, they recommended more joint, interagency, and multi-national (JIM) cross training in realistically complex situations.

Position	Sub Issue Finding
Battalion Commander	CCTT prepared units to avoid fratricide incidents. Commanders recommended depicting a greater variety of friendly vehicles to better prepare units to avoid fratricide.
S3	S3s reported two blue-on-blue events, one in which Iraqi police were mistaken for insurgents and one in which their unit traversed another unit's area and reacted to an attack on the other unit without proper coordination. S3s recommended being able to train dismounts in MOUT environments. They also recommended great scenario clutter.

Company Commander	Company commanders reported more friendly incidents than battalion respondents. These were mostly incidents caused by misidentifying targets, by poor coordination between flanking or co-located units, and by lack of situational awareness. Two-thirds of commanders stated CCTT prepared their unit for friendly fire incidents. Commanders recommended putting actual operational terrain into CCTT, allowing familiarization training. Commanders reiterated recommendations to make environment more complex with urban terrain, mosques, and civilians. Commanders recommended graphics good enough to allow friend-or-foe identification.
Platoon Leader	21% of platoon leaders reported a friendly fire incident. These consisted mostly of misidentification. Three-fourths of platoon leaders felt CCTT prepared their units for these situations. Platoon leaders said training with sister services (marines) and increased MOUT training would help prevent fratricide.
Platoon Sergeant	Only about one-fourth of platoon sergeants reported a blue-on-blue incident in Iraq. These were all from misidentification, either at night or in the day due to stress or enemy action. Two-thirds of platoon sergeants stated CCTT adequately prepared them for these events. A minority of platoon sergeants provided recommendations for improvement. These include more urban settings; more friendly dismounts including observation posts, patrols, checkpoints, and road blocks; SAF friendly units; and joint training (with marines). Some recommended putting vehicle markings on CCTT vehicles.

SUBISSUE 4.6: Were combined arms or joint operations conditions encountered in combat different than as represented in CCTT?

FINDING: Most units did not conduct combined arms training in CCTT during pre-deployment. The combined arms training conducted was limited to armor-infantry cooperation. No unit conducted joint training. Recommendations for improving combined arms and joint training capability include adding dismounted capability, improving CAS modeling, adding additional vehicles including foreign and sister service vehicles and HMMWVs.

Position	Sub Issue Finding
Battalion Commander	According to battalion commanders, combined arms training did not seem important as an objective of their pre-deployment training. The majority reported conducting combined arms training, but it was limited to armor-infantry. Only one reported using CCTT to train air-ground coordination by platoon leaders. No battalion commander used CCTT to train joint operations. To better support combined arms training, commanders recommended increasing the variety of weapon and vehicle systems and improving dismounted operations modeling. Commanders recommended adding a Ground, Forward Air Controller (GFAC) to support joint operations and building in a method to train inter-agency coordination.
S3	Only one-third of S3s were able to conduct combined arms training in CCTT as part of pre-deployment training, due to time constraints. The one S3 whose unit did train combined arms stated CCTT was very adequate. S3s recommended several ways to make CCTT more effective. Several recommended being able to task organize down to vehicle level. One S3 recommended adding aviation simulators. No S3 trained joint operations but they recommended improving CAS modeling and building Marine vehicles and Air Force observation capabilities into CCTT.

Company Commander	Company commanders reported participating in combined arms operations of various compositions, including armor, infantry, engineer, and EOD. A small number of commanders reported training combined arms operations in CCTT. Many commanders reported conducting both joint and multi-national operations, though none reported training in joint operations in CCTT. Commanders recommended more Air Force participation and modeling coalition forces. 40% of commanders experienced some negative impact on unit readiness from training in CCTT.
Platoon Leader	45% of platoon leaders felt their unit experienced a negative impact due to CCTT.
Platoon Sergeant	Only one-fourth of platoon sergeants reported any negative impact on unit readiness from CCTT.

SUBISSUE 4.7: Were there specific battlefield events that virtual training only provided preparation?

FINDING: Respondents did not believe there were tasks which only CCTT, vice other environment or devices, could train. Several discussed the ability of CCTT to replicate specific, theater, environmental conditions, such as specific terrain or terrain types (rivers) or friendly, enemy, or neutral Order of Battle (large convoys, insurgents, civilians).

Position	Sub Issue Finding
Battalion Commander	No battalion commander felt that there were battlefield events that only CCTT could prepare their units for. However, one commander identified that CCTT could not prepare his unit for MEDEVAC or recovery operations. The commanders expressed desire for better modeling of COE conditions. This included more vehicle types, better modeling of actual OPFOR TTP, modeling of COBs, weapon effects on terrain, and JIM representation.
Battalion XO	XOs recommended a theater specific database. They recommended improved air-ground integration capability. They recommended adding the capability of generating a 5-20 truck convoy (SAF) for convoy training.
S3	The only CCTT-only event mentioned was a situation where the unit was separated from OPFOR by a river. S3s recommended several improvements to CCTT. System improvements included improving dismounts and adding resolution to create individual enemy insurgents. Administrative improvements included creating ROE scenarios, MOUT scenarios, and making it one-stop training.
Company Commander	Commanders felt CCTT cannot train units on reaction to ambush, joint raids, sniper tactics, IEDs, building clearing, CASEVAC, vehicle and personnel searches, and dismounted operations. Commanders felt only CCTT could provide training in large scale engagements, with large maneuver and firing, circular battlefields, and fratricide potential. Commanders appreciated CCTT's ability to allow multiple repetitions under identical conditions. Commanders recommended CCTT be improved via degradable communications, theater specific databases, civilians, commercial vehicles, more urban terrain, some ability to interact with civilians, and better insurgent tactics.
Platoon Leader	Platoon leaders believed that CCTT is unable to replicate close fighting; dismounted operations including cordon & search, Combat Search and Rescue (CSAR); and civil-military operations including negotiations and riot control. Platoon leaders felt only CCTT could replicate long-range engagements and large scale engagements. Platoon leaders were appreciative of CCTT's ability to repeat a scenario under identical conditions. Platoon leaders recommended more MOUT capability, more OPFOR conducting insurgent tactics including RPG attacks, IEDs, and ambushes. Platoon leaders would like to see more background noise, vehicle breakdowns, motion, and accurate environmental conditions (heat). Platoon leaders would like the ability to fight their vehicles out of their various hatches.

Platoon Sergeant	Platoon sergeants recommended making the CCTT environment more COE specific, focusing on insurgent tactics and urban terrain. Platoon sergeants wanted more dismount capability, a better loader's station, better communications and HMMWV operations. Two sergeants wanted more CCTT time and one recommended random terrain generation.

USAREUR Study

The investigation initially included USAREUR units in the desired sample in order to more accurately reflect the population. USAREUR units were not available for physical collection, but interest in visiting USAREUR continued because Europe was the only location with reported prescriptive CCTT training practices. In February 2005, the investigation team visited the USAREUR CCTT Site at Seventh Army Training Command (7ATC) in Grafenwoehr for interviews. This visit was requested because during predeployment, units being sent to Iraq were required to train in CCTT. The investigation team wanted to learn first hand the basis for this required training and how it was conducted. The team, using a separately developed protocol, interviewed ten personnel including government civil servants and contractors supporting 7ATC CCTT and combat maneuver training center (CMTC) training sites. Those questions and the consensus answers developed from an analysis of the responses is shown in Appendix C. The team also conducted a telephone interview with BG Tucker, currently Assistant Division Commander for 1st Armor Division (AD); he was the Commander of the 1st Brigade during the above events and during its subsequently operations in Iraq.

BG Tucker indicated that the prescriptive training strategy followed by his unit was a comprehensive train-up for deployment of which CCTT was one portion. The goal of this directed training was to insure all platoons in the Brigade demonstrated training proficiency to a minimal level (gate) prior to deployment and to re new qualifications that would expire prior to or shortly after deployment (e.g., gunnery table qualifications). The primary factor in focusing this training at platoon level was time available prior to deployment. BG Tucker believes the entire training regime used – dubbed the Two Minute Drill (2MD) – was a successful approach and contributed to the ability of the unit to execute its missions in the combat theater.

The following findings were derived from reviewing data collected resulted from the separate portion of this investigation conducted in USAREUR:

- USAREUR, specifically 1st AD, used CCTT to insure all Armor and Mechanized Infantry Platoons had achieved a minimal level of training proficiency on select close combat tasks anticipated for operations in Iraq.
    - Training was prescriptive
    - Dedicated and experienced CMTC Observer/Controllers managed the CCTT training
    - Scenario content was custom designed by 7th ATC
    - A standard task set and conditions were established by higher echelon headquarters

- Units and Soldiers that went through the 2MD in CCTT were highly cooperative, enthusiastic, and accepted the need for structured training.

- CCTT scenarios were part of a command-wide strategy (Two Minute Drill) to hone gunnery and maneuver skill sets

- Positive Aspects

    - Units could train on Terrain similar to where they would fight
    - Scenarios could be repeated as many times as each platoon required
    - Observer/Controllers insured consistent conduct of scenarios
    - Higher level command and staff could concentrate on other deployment duties

- Negative aspects

    - The "doctrinally" designated trainer did not have responsibility or control of the training
    - Units with high readiness levels did not get to use the training time to further enhance skills
    - Approach required contractor site augmentation to support 24/7 operations
    - Non deploying units lost scheduled training time and access to virtual simulation
    - Other training venues (e.g. CMTC) operations were reduced in order to provide O/C staff at CCTT

The USAREUR experience validates the potential for prescriptive, structured training in virtual simulations, but a specific approach to executing such a strategy needs further investigation. The 2MD was more akin to a certification than training: certification at the Division and higher level than at the small unit level central to this investigation.

Tasks were approved by Division but selected by CMTC, an Army level asset, based upon their assessment of OIF tactical requirements. Current platoon training levels and anticipated roles of platoons within Company and Battalion maneuver schemes were not a factor in the 2MD. Doctrinal platoon trainers, the battalion leadership, neither directly participate in the preparation, execution nor assessment. There was some company leadership presence, but the only reported leader regularly involved was the Division Commander. Training results, other than a "pass," did not appear to have been captured nor was there follow-up to insure retention of skills, though this could very likely have happened in theater. The 7ATC after-action report (Russel, 2003) mentions CCTT in the description of the total effort, but does not list it as an accomplishment.

This was a successful certification event, well planned and executed. Platoons were required to demonstrate required proficiency on the centrally selected tasks and the event took advantage of the ability of CCTT to replicate the same exercise, reiterating a scenario until a platoon demonstrated competency. Platoons not demonstrating competency received excellent coaching from the Observer/Controllers. Only the

controlled, prescriptive execution of the 2MD would have allowed the number of platoons to pass through the CCTT facility in the limited time available and coordinate that event with the others occurring at 7ATC. The impact though was a lack of flexibility in tasks. Given CCTT's flexibility and skill of 7ATC personnel, units might have presented a menu from which small unit leaders could have selected tasks that were most appropriate to their unit needs.

USAREUR's successes do not necessarily shed light on the concept of prescriptive CCTT use. Prescription creates efficiencies in operation and alleviates the weaknesses of subordinate leaders. On the other hand, prescription can limit initiative and innovation, preventing junior leaders from developing new and unique solutions.

In general these findings are not directly incorporated into the overall investigation findings unless relevant but are included here for both sake of completeness and potential use as further insight by the government.

Macro Level Analysis Results

The below chart shows CCTT usage man-hours by echelon for the period January 2002 to February 2004 for units that deployed to OIF during that time frame. Some insights from this chart include:

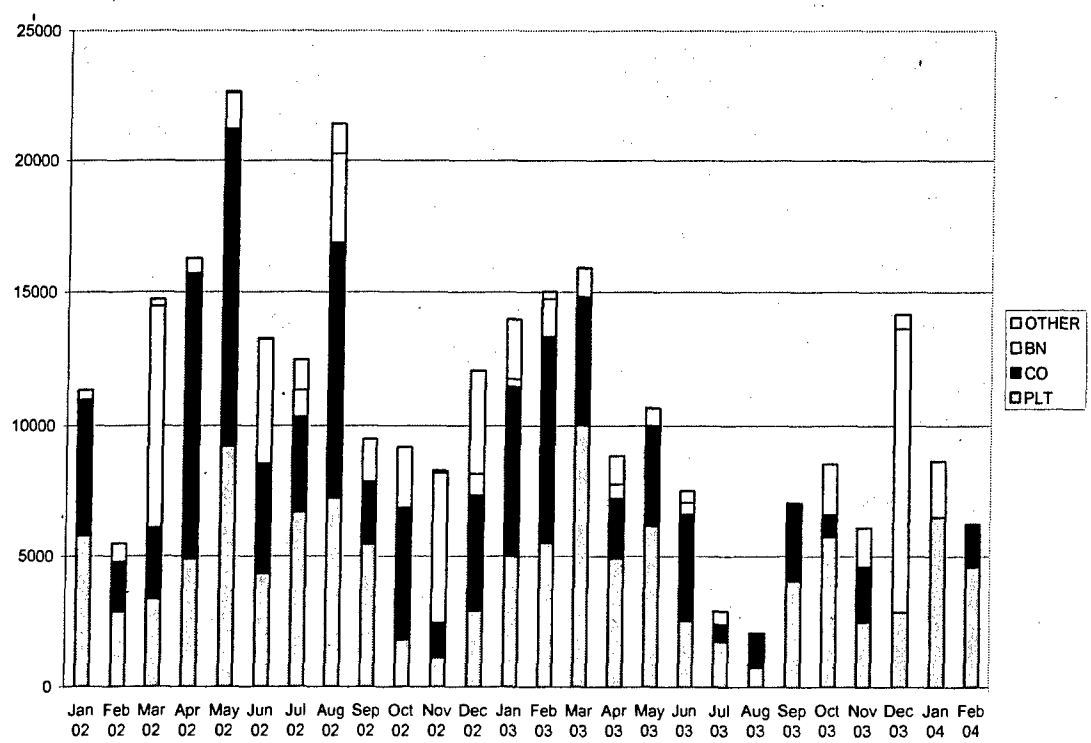

Figure 5. CCTT usage hours, Jan 02-Feb 04

- Training usage appears to be cyclical.

- Before OIF, there was a near equilibrium between platoon and company echelon training. Significant battalion training occurred approximately every third month.

- There was a downward trend beginning in April 2003, when the majority of units deployed. The data shows a gradual increase in usage towards the end of the time frame.

- This gradual increase consisted almost exclusively of platoon echelon training, indicative of battalions beginning a re-training regimen to develop their high intensity conflict skills (all the battalion usage hours in December 2003 and January 2004 are all attributable to one unit, 3-7 CAV).

Discussion:

Users see CCTT as a critical and effective training tool. However, it is seen as an addition to live training; and most often used as a substitute when resources to support live training are unavailable. Upon deployment notification, units received priority access to the resources needed to perform live training. Therefore, live training was given priority over virtual training. Units considered themselves, in general, trained in the collective tasks supported by CCTT. Therefore, the training focus shifted toward individual tasks, collective tasks not supported by CCTT (such as dismounted MOUT operations), and certification. The overall impact of these factors is that deploying units did not consider CCTT essential to pre-deployment training and it was not included in training plans.

Nevertheless, users want to train in CCTT. Interviewees demonstrated a keen interest in CCTT. But their interest translated into modifying CCTT into a means to place units into anticipated environments using virtual simulations, i.e. theater-specific training scenarios or mission rehearsals.

A key observation from the OIF investigation is that the conditions for using CCTT have changed dramatically since the inception of Operation IRAQI FREEDOM. The advent of SARO operations in Iraq in combination with the knowledge of eventual deployment to conduct those operations is causing the traditional CCTT user audience to seek training tools that allow them to focus on conditions and tasks they will face in-theater. Users want CCTT to evolve from a general, collective task trainer toward a mission rehearsal tool. This means simulating the complex battlespace they will face in theater, for Iraq this includes system capabilities such as dynamic urban terrain, an ever-present and interactive civil population, and actual threat TTPs. In general terms, users desire the ability to rapidly modify CCTT training conditions to emulate expected conditions they will encounter in theater.

Finally, the investigation revealed that users are very personal and hands-on in designing CCTT training. Users prefer creating their own training events, in lieu of using TSPs.

Setting up CCTT training is dependent upon face-to-face interaction between the site staff and the unit leadership.

ARNG Study:

The purpose of the ARNG investigation was to assess training and leader development using VMTs in the ARNG. Data was collected using physical interviews and written surveys and from web surveys. Physical interviews and written surveys were conducted between March and June, 2005. Data was collected via the web between March and May, 2005. Table 3 shows the total number of respondents from which data was collected and analyzed, while Table 4 and 5 the number of respondents from the physical and web collection efforts respectively.

Table 3. ARNG Investigation Total Respondents

BN CDR	BN S3	BN MG	CO CDR	PLT LDR	PLT SGT	AC Advisor	Site Staff	TADSS Fac	Total
85	114	37	228	280	536	24	17	20	1341

Table 4. ARNG Investigation Physical Data Respondents

Unit	BN CDR	BN S3	BN MG	CO CDR	PLT LDR	PLT SGT	Total
1-118 IN	1	1	1	2	3	5	13
2-136 IN	1	1	1	3	6	6	18
3-144 IN	1	1	1	2	1	1	7
2-185 AR	1	1		3	1	3	9
5-117 CAV	1	1	1				3
1-262 AR	1	1	1	3	8	6	20
1-167 CAV	1	1		3	5	9	19
1-167 IN	1	1		2	4	5	13
4-112 AR			1				1
Total	8	8	5	18	28	35	103

Table 5. ARNG Investigation Web Collected Data Respondents

BN CDR	BN S3	BN MG	CO CDR	PLT LDR	PLT SGT	AC Advisors	Site Staff	TADSS Fac	Total
77	106	32	210	252	501	24	17	20	1239

Findings:

ISSUE 1: What strategies are used by ARNG for training with VMTs

FINDING: The ARNG is using VMTs to train platoon level maneuver tasks. ARNG units perceive value in VMTs, but VMTs are not seen as integral to training. Rather, the ARNG sees VMTs as add-ons to training. Commanders have not published specific use guidance.

SUBISSUE 1.1: Does the unique conditions/missions of the ARNG lead to VMT strategies different from the Active Component?

SUBISSUE 1.1 FINDING: ARNG conditions, but not missions, cause VMT use differing from the Active Component. ARNG unique missions, including state level missions and mobilization, are not leading factors in determining a VMT strategy. The ARNG generally does not see a relationship between VMTs and state missions, other than some transference of individual and leader skills. Rather, the unique conditions of the ARNG IDT/AT scheduling and the geographical dispersion of their units are the driving factors in how they use VMTs. Therefore, the determining factor when it comes to integrating VMTs into an over all training strategy is not training management, but logistics, including system availability, training time available, and transportation to training sites.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	ARNG conditions, not missions, cause ARNG VMT strategies to differ from the Active Component. Battalion Commanders state the prime factors impacting VMT use is time available (4 references) followed by scheduling (2), and unit location/dispersion (2). State missions are fourth on the list. No Commander believed VMT training supported readiness for state missions. VMT scheduling is decided based upon preserving AT for live training, system availability, staff recommendation, company schedules, and to execute concurrent training at IDTs.
	ARNG missions do not lead to VMT strategies different from the Active Component. Battalion commanders do not see VMTs as supporting training for unique, state missions, though some see transference of individual and leader skills. ARNG conditions do lead to different VMT strategies. Unit dispersion, IDT/AT scheduling requirements, VMT availability, deployments, state missions, and MOS/TO&E changes, in order, are all ARNG conditions mentioned as having the greatest impact on use of VMTs. The impact is logistical considerations, including VMT availability and preserving AT for live training, are the two most mentioned factors in a VMT strategy. A training management factor, using VMT to prepare for a major training event, is third.
BN S3	ARNG conditions, but not missions, lead to VMT strategies differing from the Active Component. S3s report the primary factor impacting use of VMTs is time availability (3 references). S3s generally believe VMTs do not support state mission (4 out of 6). Where S3s see transference is in basic military discipline and teaching leader skills. Factors impacting integrating VMTs into training schedules include time availability, system availability, availability of other resources, and preserving AT for live training.
	ARNG conditions, but not missions, lead to VMT strategies different from the Active Component. IDT/AT schedule requirements (24 references), unit location/dispersion (18), and scheduling conflicts with AC units (13) are the leading Guard conditions impacting VMT use. Mobilizations/deployments and state missions are seventh and eighth on the list. S3s (37 respondents) do not see VMTs as supporting state missions. A few saw a transference of leader skills (8), team building (3).

BN MG	ARNG conditions, but not missions, lead to VMT strategies differing from the Active Component. According to Master Gunners, the leading factor impacting use of VMTs is time availability (2 references) followed by location/dispersion, crew turbulence, MOS changes, and scheduling. No Master Gunner believed VMTs supported state missions. The leading factor in integrating VMTs into training strategies is time availability (2 references) followed by preserving AT for live training and scheduling VMTs to prepare for live training.
	According to master gunners, ARNG conditions lead to VMT strategies different from the Active Components, missions do not. Unit dispersion/location (10 references), IDT/AT scheduling (8), time availability (5), system availability (3), and Soldier availability (2) are all conditions impacting on VMT strategy. Mobilization/deployment is fourth on the list (3 references) and state missions are not mentioned. Master gunners feel VMTs provide little to no support for state missions (14 references). The predominant factor on VMT scheduling is system availability (5 references) followed by integration into a train-up (4), travel time (4) and scheduling around other planned training (3).
CO CDR	ARNG conditions more than missions lead to VMT strategies differing from the Active Component. Company Commanders report the leading factors impacting VMT use are dispersion/location and IDT/AT scheduling (6 references each). State missions are third tied with scheduling (2 references). Commanders generally do not believe VMTs support state missions (11 references), though some see bleed over with such things as team building, dealing with stress, confidence building and familiarization. Commanders report battalion decides how VMTs are integrated into training schedules (8 references). Other factors are time availability, system availability, and transportation availability.
	ARNG conditions, not missions, cause VMT strategies to differ from the Active Component. Of those ARNG circumstances that impact ARNG use of VMTs, missions are eighth and ninth on the list (7 and 5 references, respectively). Leading the list is dispersion/location (39), IDT/AT scheduling (26), time availability (18), scheduling (15), funding (12), system availability (9) and MOS/MTO&E changes (7). Company commanders do not believe VMTs support state mission or civil support (53 references). For those commanders who see a connection, that connection is generally some transference in individual and leader skills and in appreciating conditions, including allowing new scenarios (6), training leader tasks (5), and building unit cohesion (4). Company commanders report that the predominant factor in scheduling VMT training is system availability (22 references), followed by preserving AT for live training (13), executing a train-up for a critical training event (8), and time availability (7).
PLT LDR	ARNG conditions, not missions, cause VMT strategies differing from the Active Component. Factors listed by Platoon Leaders that impact use of VMTs are ARNG conditions, not missions. The lead factor is IDT/AT scheduling (9 references) followed by general scheduling and system availability (2). Platoon Leaders generally do not believe VMTs support training for state missions (8 references) though a minority list some training bleed over, including: improves general readiness, training individual and leader skills, and builds teamwork and confidence. The factor that most impacts integration of VMTs into training plans is time availability (3 references) followed by system availability and preparing for a key training event (ramp strategy) (2).
	The unique conditions of the ARNG, but not the missions, lead to VMT strategies different from the Active Component. According to platoon leaders, state missions are fourth on the list of ARNG conditions impacting VMT usage (11 references). The lead condition is IDT/AT scheduling (41), followed by location/dispersion (21), and availability (12). Mobilizations/deployments are ninth on the list (6 references). The majority of platoon leaders do not believe VMTs support state missions (64 references). Some platoon leaders see skill cross-over, including cohesiveness (11), general training benefit (5), and situational awareness development (5). Platoon leaders reported higher echelons drive scheduling of VMTs (34 references). Other factors in scheduling VMTs are system availability (10) and time availability (9). A training management factor, using them to train to a key event, is fourth on the list (7 references).

PLT SGT	ARNG conditions, not missions, lead to VMT strategies differing from the Active Component. According to Platoon Sergeants, the leading factor impacting use of VMTs is IDT/AT scheduling (12 references) followed by dispersion/location and MOS changes (5 each), MOS changes (5) and time availability (4). ARNG specific missions, mobilize/deploy and state missions, are sixth and eighth on the list. Generally, Platoon Sergeants report that VMTs do not support readiness for state missions (11 references) while a few Sergeants see some general bleed over including improving general skills and providing familiarization.
	According to platoon sergeants, the unique missions of the ARNG have little impact while ARNG conditions have great impact on the use of VMTs. ARNG mission specific conditions: state missions and mobilization/deployments, are listed eighth and ninth (23 and 12 references, respectively) on the list of conditions impacting VMT use. Platoon sergeants overwhelmingly (132 respondents) see no connection between VMTs and state level missions. Those mentioning a connection mention individual, leader, or other secondary cross-over benefit, including teamwork, familiarization, command and control skills, and Soldier skills, in order. Leading ARNG conditions impacting VMT use strategies include: ADT/AT scheduling (81 references), MOS changes (35), scheduling (28), time availability (27), availability of systems (26), unit dispersion (25), and training site location/distance (24), in order. Platoon sergeants stated the number one determinant on when to integrate VMTs into training, during IDTs or during ATs, is system availability (32 references). A training management related determinant, ramping up to a training event, is next (12 references). Other deciders include: availability of time (11), support for other training events (9), preserving AT for live training (7), and availability of Soldiers (3).
AC ADV	AC Advisors describe conditions, not missions, as causing ARNG VMT strategies differing from the Active Component. AC advisors state IDT/AT scheduling (5 references) and dispersion/location (3 references) are leading factors impacting ARNG usage strategy. They state integrating VMTs into training is based first on preparing for AT (2 references) and then on availability (1).
TADSS Facilitators/ COTA	ARNG conditions and missions cause the ARNG to follow a VMT strategy different from the Active Component. The factors of unit location/dispersion and state missions have the leading impact on use of VMTs (4 references each), followed by IDT/AT scheduling (3) and MOS/TO&E changes (2). TADDS facilitators and COTAs believe VMTs do not support state missions (three references), though some see a bleed over in leadership and convoy training. TADDS facilitators and COTAs report the leading factors in scheduling VMTs are preparation for a live training event and system availability (3 references each).

SUBISSUE 1.2: Is platoon echelon training the right level of usage for mobile trainers during IDT?

SUBISSUE 1.2 FINDING: Platoon echelon training is the right level of usage for VMTs. However, comparing current platoon to company training ratios to desired, users want company level training to increase relative to platoon level training. CCTT users are slightly more likely than SIMNET users to desire less platoon and more company level training.

[ ]--Highlights top two training ratios.

Position	Sub-Issue Finding by Position: Physical Web					
BN CDR		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	All Training	62.50%	37.50%	0.00%	0.00%	0.00%
	Current VMT Training	87.50%	12.50%	0.00%	0.00%	0.00%
	Desired VMT Training	0.00%	50.00%	50.00%	0.00%	0.00%

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	23.73%	57.63%	18.64%	0.00%	0.00%
Current VMT Training	44.64%	26.79%	19.64%	7.14%	1.79%
Desired VMT Training	11.54%	50.00%	26.92%	11.54%	0.00%

BN S3

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	14.29%	85.71%	0.00%	0.00%	0.00%
Current VMT Training	42.86%	28.57%	28.57%	0.00%	0.00%
Desired VMT Training	0.00%	57.14%	42.86%	0.00%	0.00%

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	14.29%	63.49%	12.70%	7.94%	1.59%
Current VMT Training	35.59%	47.46%	8.47%	6.78%	1.69%
Desired VMT Training	9.84%	40.98%	37.70%	9.84%	1.64%

BN MG

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	16.67%	66.67%	0.00%	16.67%	0.00%
Current VMT Training	66.67%	33.33%	0.00%	0.00%	0.00%
Desired VMT Training	0.00%	50.00%	50.00%	0.00%	0.00%

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	16.67%	41.67%	25.00%	16.67%	0.00%
Current VMT Training	34.78%	34.78%	17.39%	8.70%	4.35%
Desired VMT Training	30.43%	34.78%	30.43%	0.00%	4.35%

CO CDR

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	17.65%	70.59%	5.88%	5.88%	0.00%
Current VMT Training	47.06%	29.41%	11.76%	11.76%	0.00%
Desired VMT Training	5.88%	64.71%	29.41%	0.00%	0.00%

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	21.10%	57.80%	12.84%	6.42%	1.83%
Current VMT Training	39.60%	40.59%	9.90%	3.96%	5.94%
Desired VMT Training	5.10%	50.00%	41.84%	3.06%	0.00%

PLT LDR

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	4.00%	52.00%	36.00%	8.00%	0.00%
Current VMT Training	16.00%	32.00%	40.00%	12.00%	0.00%
Desired VMT Training	4.17%	29.17%	62.50%	4.17%	0.00%

	PLT/CO Training Ratio				
	100/0	75/25	50/50	25/75	0/100
All Training	11.72%	57.03%	17.97%	12.50%	0.78%
Current VMT Training	36.75%	30.77%	16.24%	8.55%	7.69%
Desired VMT Training	5.08%	49.15%	40.68%	4.24%	0.85%

		PLT/CO Training Ratio				
PLT SGT		100/0	75/25	50/50	25/75	0/100
	All Training	16.67%	63.33%	13.33%	6.67%	0.00%
	Current VMT Training	27.59%	24.14%	27.59%	17.24%	3.45%
	Desired VMT Training	3.33%	46.67%	46.67%	3.33%	0.00%
		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	All Training	8.67%	52.33%	22.33%	14.00%	2.67%
	Current VMT Training	23.33%	29.63%	22.59%	12.22%	12.22%
	Desired VMT Training	8.08%	41.54%	43.85%	4.62%	1.92%
AC ADV		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	All Training	9.09%	54.55%	27.27%	0.00%	9.09%
	Current VMT Training	27.27%	36.36%	18.18%	9.09%	9.09%
	Desired VMT Training	18.18%	27.27%	36.36%	18.18%	0.00%
TADSS Facilitators/ COTA		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	All Training	0.00%	53.85%	38.46%	7.69%	0.00%
	Current VMT Training	30.77%	46.15%	15.38%	7.69%	0.00%
	Desired VMT Training	6.67%	60.00%	26.67%	6.67%	0.00%
Site Staff		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	Desired VMT Training	0.00%	66.67%	33.33%	0.00%	0.00%
CCTT Users		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	Desired VMT Training	7.51%	44.55%	41.89%	5.08%	0.97%
SIMNET Users		PLT/CO Training Ratio				
		100/0	75/25	50/50	25/75	0/100
	Desired VMT Training	11.22%	45.37%	35.61%	4.88%	2.93%

SUBISSUE 1.3: What are the ARNG unit VMT strategies? How do they differ by region or command?

SUBISSUE 1.3 FINDING: ARNG units use VMTs to train platoon level, maneuver tasks. Gunnery and leader training are other significant uses. There is no top-down usage guidance. When there is guidance, it is non-specific, such as "maximize use" or "use when available." ARNG units use VMTs to prepare for live events. VMT results are not significant in executing training plans. Strategies did not differ by region or command.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	Battalion Commanders report the primary purpose of VMTs is platoon collective training (2 references) followed by command and control, preparing for live training, gunnery, situational awareness, validate leaders, and crew coordination. Battalion Commanders report receiving little or no usage guidance from higher HQs. The few that reported guidance received nonspecific guidance, including maximized use and use is encouraged. 38% report tracking VMT usage. 50% report modifying training strategies based upon VMT results. 62% report using VMTs to prepare for live training.
	Battalion commanders integrate VMTs into their training strategies in a wide number of ways, the predominant being as preparation for other events, leader validation, and collective maneuver task training, in order. 80% of battalion commanders report using VMTs to prepare for live events. Battalion commanders have generally received little of no usage guidance. Guidance they have received has generally been non-specific. 49% of battalion commanders report their units tracking VMT usage. 46% report modifying training strategy based on VMT results.
BN S3	S3s report the primary role of VMTs is to train gunnery (4 of 7 S3s). They also mention training collective maneuver tasks and a replacement for live training. S3s have received no usage guidance (6 of 7). One S3 reported nonspecific guidance: usage was encouraged. 57% of S3s report their unit tracks VMT use. 29% report their unit has modified it training strategy based upon VMT results. 86% report using VMTs to prepare for live training.
	The predominant way S3s report VMTs being integrated into their training strategies is as leader trainers (10 references). Other ways include: preparation for key training event (9), small unit task training (9), a replacement for live training (6), and gunnery training (6). S3s have generally received no or little VMT usage guidance (23 references). Those reporting guidance report non-specific guidance, including: maximize use (8), encourage use (4) and use when available (2). Five S3s reported being told to execute a minimum number of hours per year and one S3 received guidance specific to echelon (platoon) and management (rehearsal). 51% of S3s report tracking VMT usage. 54% report modifying their training strategy based upon VMT results. 82% report using VMTs to prepare for live training.
BN MG	Master Gunners report the primary roles of VMTs are training platoon collective maneuver tasks and leaders training (2 references each). Three Master Gunners report receiving no VMT usage guidance from higher HQ while three report non-specific guidance including: use if possible (2) and maximize use. 50% report their units track VMT use. 67% report they have modified their training strategy based on VMT results. 83% report they use VMTs to prepare for live training.
	Master gunners report their units predominantly integrate VMTs into their training strategies as collective maneuver task trainers (9 references) and gunnery trainers (7). Other uses include leader trainers (4), SOP development tools (3), and familiarization tools (2). Master gunners report they have generally received little or no usage guidance from higher HQs (9 references). Some Master Gunners report guidance specified down to length of exercise, iterations, and echelon per year (3 references) but other reported guidance is non-specific: use as much as possible (2), use as available (1) or use during AT (1). 76% of Master Gunners report tracking VMT usage. 67% report modifying training strategy based upon VMT results. 86% report using VMTs to prepare for live training.

CO CDR	Company Commanders state the primary role of VMTs is maneuver training (4 references) followed by gunnery (3) and sustainment training, command and control training and unit coordination (2 each). Generally, Commanders have not received any VMT usage guidance from higher commands. Those that report guidance report non-specific guidance, including use it for mounted training and use it as much as possible (2 each). 62% of Commanders report their units track VMT usage. 38% report their unit has modified its training strategy or plan based on VMT results. 65% report their units use VMTs to prepare for live training.
	Company commanders report that the primary use of VMTs is to train platoon collective maneuver tasks (24 references) followed by leader/staff training (13), team building (8), crew training (7), and gunnery training, low-cost training alternative, and prepare for major training events (6 each). Ten commanders reported VMT had no role in their units' training strategies. Company commanders have not received VMT usage guidance from their higher HQs (40 references). Of the commanders who reported some guidance, there were twelve references to specific minimum use and three references to guidance on number of crews per time period and specified tasks. Other guidance was nonspecific, including maximize use (9), use when possible (6), and use encouraged (2). 46% report their unit tracks VMT usage. 37% report they have modified their training strategy based on VMT results. 75% report they use VMTs to prepare for live training.
PLT LDR	Platoon Leaders have generally not received any VMT usage guidance from their higher commands. Of those reporting guidance, two reported directed use while the rest reported non-specific guidance such as: use for mounted training, use for crew training, use when available, and use rarely. 71% of Platoon Leaders state their unit tracks VMT use. 33% state their unit has modified its training plan based on VMT results. 75% report using VMTs to prepare for live training.
	The majority of platoon leaders, forty, report receiving no or little VMT usage guidance. Some platoon leaders report receiving unspecific guidance, including: use as much as possible (7 references), a scenario as guidance (7), date/location/uniform (5) and if available, use it (4). 62% of platoon leaders report their unit tracks VMT usage. 34% of platoon leaders report their unit has modified its training strategy based upon VMT results. 77% of platoon leaders state their units use VMTs to prepare for live training.
PLT SGT	Platoon Sergeants generally say they have received no VMT usage guidance. The few that report guidance report it as non-specific, such as reporting availability and encouraging use. 61% of Sergeants report their unit tracks VMT use. 57% report their unit has modified its training plan based on VMT results. 80% state their units use VMTs to prepare for live training.
	142 platoon sergeants report that they have received little or no VMT usage guidance from higher commands. One platoon sergeant reported a specified minimum use. Three reported directions to use it as a gate for gunnery or maneuver. Others reported guidance such as use it as much as possible (14 references), use if available (8), use only with gunnery (3), and maintain a level of realism (2). 39% of platoon sergeant respondents reported their units tracked VMT usage. 28% reported their units modified training strategy based upon VMT results. 60% reported using VMTs to prepare for training in a live environment.
AC ADV	AC advisors report that the primary role of VMTs in ARNG units is maneuver trainer (4 references) followed by communication trainer (2). Two stated VMTs had no role. AC advisors state their units have received no usage guidance except for one advisor who provided a nonspecific guidance, "use as often as possible." 30% of advisors stated their units tracked VMT usage. 40% stated their units modified their training strategy based on VMT results. 50% stated their units used VMTs to prepare for live training.
TADSS Facilitators/ COTA	TADSS facilitators and COTAs report the primary role of VMTs is to prepare for a key training event (ramp strategy) and to train leaders (3 references each). The next leading role is to validate SOPs (2). 80% report tracking VMT usage rates. 64% report units modify training strategies based upon VMT results. 93% report units use VMTs to prepare for live training.

SUBISSUE 1.4: How critical are VMTs to METL proficiency?

SUBISSUE 1.4 FINDING: ARNG units do not view VMTs as critical to METL proficiency, but believe there is great value in VMT training. Less than one-third of respondents reported raising or sustaining a METL task assessment based solely on VMT results. Slightly more SIMNET users than CCTT users report raising a METL task assessment based solely on VMT results, 46% versus 33%. Respondents are using VMTs to train platoon collective tasks, gunnery, and platoon drills. Units are unable to train logistical/sustainment tasks. Company leadership reported that SARO tasks are not adequately supported by VMTs.

Battalion level respondents equate the value of access to a VMT as equivalent to 2-4 field exercises (STX or FTX) and 1 gunnery. Company level respondents perceive more gunnery value, equating VMTs to 2-4 field exercises and 1-3 gunneries.

Other objectives for VMT exercises include unit cohesion, familiarization, and coordination. Respondents indicate VMT exercises are modified when necessary during execution to achieve specific training objectives, but not to the extent that their overall objectives or goals for the event are compromised.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	Battalion Commanders report using VMTs to train movement to contact, defend, and gunnery (3 references each) followed by screen (2), attack, attack by fire and route recon. Battalion Commanders report that they are not able to train mobilize/deploy (4 references) followed by SASO, and security operations. One Commander stated there were no missions he could not train. 38% stated they had sustained or raised a METL assessment based only on performance in VMTs. Battalion Commanders stated their VMTs provided the equivalent training of 1-3 PLT STX lanes and 1 gunnery. Commanders reported that normal training objectives were to exercise/validate SOPs or obtain a "p" or "t" on an assigned task (2 references each). Other reported objectives were: conduct a specific collective task, execute until the company commander is satisfied, execute multiple iterations, or increase crew proficiency. 38% of Commanders report these objectives are usually achieved and 38% report they are often achieved. 50% of Commanders say VMT training events are never modified to reach training objectives while 25% state they are usually modified.
	Battalion commanders report training offensive and defensive tasks in VMT as opposed to stability and reconstruction or civil support tasks. Most mentioned tasks include attack, defend, and movement to contact, in order. Battalion commanders mentioned sustain, mobilize/deploy, and conduct joint fires as the three leading tasks they could not perform in a VMT, though most commanders felt there were no tasks they could not train. 32% of battalion commanders reported raising or sustaining a METL training assessment based solely on performance in a VMT. Commanders believed their units would require a gunnery, a combined arms live fire exercise, 3-6 field training exercises, and a command post exercise to replace their VMT training, though many stated VMTs can not replace live training. The most commonly reported VMT training objective was a specified training level in a specified tasks (19 references), though other objectives cited were non-specific, including improve command, control and communications (9 references); execute Troop Leading Procedures (3 references); and improve gunnery skills (3 references). Commanders reported achieving these objectives usually (32%) or often (30%) with 10% reporting never and 5% reporting always. Commanders report modifying a VMT exercise during execution to reach training objectives sometimes (53%) while 16% report never and 5% reporting always.

BN S3	S3s report using VMTs to train defend (3 references), movement to contact, attack, and command and control (2 references each). S3s state they are unable to train mobilize/deploy (4 references) and logistics/sustainment (2). 29% report sustaining or raising a METL task training assessment based solely on performance in a VMT. S3s report VMTs provide them the equivalent training of 1-4 STX lanes and 1 gunnery. S3s report the normal training objective for a VMT exercise is to conduct tactical movement (4 references) followed by reporting and command and control (2), mounted navigation, crew coordination, proper use of weapons, unit cohesion, and Soldier participation. 33% of S3s report training objects are achieved often and 33% report they are achieved usually. 50% report VMT training objectives are modified to reach training objectives sometimes.
	S3s do not see VMTs as critical to METL proficiency. S3s report using VMTs to train defend (20 references), attack (16), movement to contact (10), and gunnery (5). S3s report they cannot use VMTs to train logistics/sustainment (7 references), mobilize (6), deploy (5), dismounted tasks (4), and force protection (3). 32% of S3s have sustained or raised a METL training assessment based only on performance in a VMT. S3s report they would require between one and three FTXs and an additional gunnery each year to replace the training they receive from VMTs, though they emphasize VMTs cannot replace live training. S3s report the typical training objective for a VMT exercise is to train to a specific proficiency for a specific task (12 references). Other objectives are less specific, including: train leader/staff skills (9), validate/rehearse tasks prior to live training (5), familiarity (3), and enhance coordination (2). 40% of S3s report these objectives are usually obtained while 26% state they are sometimes and 24% state they are often obtained. 57% of S3s state VMT training events are sometimes modified to reach training objectives, while 23% state they are often modified and 14% state they are never modified.
BN MG	Master Gunners report their VMT training is equivalent to 2-6 platoon STX lanes. Normal training objectives for a VMT exercise include execution of battle drills, making marked improvement, and specific platoon maneuver task training. 67% of Master Gunners state objectives are usually achieved. 50% state VMT training events are sometimes modified to reach training objectives and 33% state they are often modified.
	Master Gunners believe their units would require between 1 and 4 field training exercises plus a gunnery to replace the training value of their VMTs. However, they fell strongly that VMTs cannot replace live training. Master Gunners report normal training objectives are basic task proficiency (i.e. drills/formation) (7 references), leaders training (5), familiarity (2), and none (2). Only four reported establishing proficiency in specified tasks as a training objective. 40% of Master Gunners report objectives are usually achieved with 35% reporting often and 20% reporting sometimes. 60% report VMT exercises are modified sometimes to achieve objectives, while 20% report usually, 15% report often, and 5% report never.

CO CDR	Company Commanders report they train movement to contact (6 references), defend (5), attack and actions on contact (3 each), movement techniques and gunnery (2 each). They are unable to train SASO and mobilize/deploy (2 references each). 44% report sustaining or raising a METL assessment based only on performance in a VMT. Company Commanders report VMTs provide them the equivalent of one week of maneuver training per year. The normal training objective for a VMT exercise is to train a collective maneuver task (7 references) followed by gunnery training, increasing unit coordination, and training command and control (2 each). 37% of commanders report these objectives are usually obtained and 31% state they are often obtained. 53% of Commanders say VMT exercises are sometimes modified during execution to obtain training objectives and 41% state they are often modified.
	Company Commanders report using VMTs to train attack (21 references), movement to contact (20), defend (18), actions on contact (11), gunnery (8) and tactical movement (7). Commanders are unable to train SASO (9 references), all (5), MOUT (5), assembly area procedures (3), and mobilize/deploy (3). Nine commanders reported there were no tasks they could not train on their VMT. 27% of commanders report that they have sustained or raised a METL training assessment based only on unit performance in a VMT. Commanders believed their VMTs provided the training equivalent of 2-4 field training exercises, 1 gunnery, and a CALFEX. Commanders strongly believed that VMTs are not a substitute for live training. Normal VMT training objective is platoon collective task to proficiency (15), followed by platoon drills/movement techniques (9), command and control tasks (8), crew tasks trained to proficiency (5), skill improvement (4), and individual tasks trained to proficiency (3). Four commanders reported that VMT exercises normally have no objectives. 35% of commanders report training objectives are achieved usually while 23% report objectives are obtained often and 23% report they are obtained sometimes. 55% of commanders report VMT training is modified to reach training objectives sometimes, while 15% report it is modified often and 13% report it is never modified.
PLT LDR	Platoon Leaders report that VMTs provide the equivalent of 1 to 2 field training exercises. The report that the normal objective of a VMT exercise is to train a collective maneuver task (7 references) followed by training gunnery (5), familiarization (4), and command and control training (2). 38% state objectives are obtained usually while 29% report they are often obtained. 36% report VMT events are sometimes modified during execution to obtain training objectives while 20% report they are never modified.
	Platoon leaders report they would require between 1 and 6 FTXs and between 1 and 3 gunneries to replace their VMT training. Platoon leaders report generally unspecific VMT exercise training objectives, including train to proficiency (22 references) followed by basic skills (15), crew or individual familiarization (11), prepare for future training events (8) and team building (4). 37% of platoon leaders report their objectives are usually obtained, while 35% state they are often achieved and 22% state they are sometimes achieved. 46% of platoon leaders stated VMT training events are sometimes modified to reach training objectives. 21% say they are often modified and 14% state they are never modified.

PLT SGT	Platoon Sergeants believe VMTs provide the equivalent training of 2-3 training events per year. They state the normal training objective of a VMT exercise is collective maneuver task (11 references) followed by gunnery training (4) and team building (3). 36% of Sergeants state training objectives are sometimes obtained while 32% state they are often obtained. 62% state VMT events are sometimes modified during execution to reach training objectives.
	VMT exercise training objectives reported by platoon sergeants include: training on collective platoon or squad tasks (46 references), train on gunnery skills (27), none (22), familiarization (9), prepare for live training (8), crew or individual proficiency (6), and leader training (5). Note platoon sergeants did not describe training specific tasks to specific training levels (i.e. P or T). 30% of sergeants report these objectives usually being achieved. 29% report them being sometimes achieved and 23% report them being often achieved. 49% of platoon sergeant report VMT training events sometimes being modified to reach training objectives. 25% report VMT training being never modified and 13% report it being often modified. Platoon sergeants believe to replace VMTs with live training and maintain METL proficiency would require one to six gunneries and two to six field training exercises. There was strong opinion that VMTs cannot replace live training.
AC ADV	AC advisors reported their units used VMTs to train movement to contact (3 references), defend (2) and attack and attack by fire. They state there units were unable to train some individual crew tasks. Advisors stated normal VMT exercise objectives included training maneuver tasks, training leader tasks, building unit cohesion, establishing SOPs and familiarization. 33% of advisors stated these objectives are sometimes achieved and another 33% stated these are often achieved. 60% stated VMT exercises are sometimes modified during execution to achieve objectives.
TADSS Facilitators/ COTA	TADSS facilitators and COTAs believe that VMTs provide the equivalent of 2 FTXs, 1-3 gunneries, and 1 CALFEX. They say the typical training objective of a VMT exercise is to conduct a tactical task (4 references) followed by leaders training (3). 50% state training objectives are often achieved while 33% state they are usually achieved. 50% state VMT exercises are sometimes modified to reach training objectives.
Site Staff	Site staff reports that the typical VMT exercise objective is to execute platoon tactical missions (2 references) followed by leader validation, preparation for live training, training proficiency, and familiarization (1 each). 33% say these objectives are often achieved, with 27% saying they are usually achieved.
CCTT Users	33% of CCTT users have sustained or raised a METL training assessment based only on performance in a VMT.
SIMNET Users	46% of SIMNET users have sustained or raised a METL training assessment based only on performance in a VMT.

SUBISSUE 1.5: Are there significantly different usage levels between units by command, geographic region or technology available?

SUBISSUE 1.5 FINDING: Macro Level Analysis and data collection observations show no discernable differences in usage levels between units due to commands, regions or technology.

SUBISSUE 1.6: In a VMT Exercise, where does training occur?

SUBISSUE 1.6 FINDING: In a VMT exercise, just under half of training occurs during execution. One-third of training occurs during AARs. AARs are critical to VMT efficiency. Users and AC Advisors report that AARs are somewhat effective. Site Staff and COTAs/TADSS Facilitators have a higher opinion of AARs, rating them as "extremely" effective. Better facilitation and audio/video recording (down to crew level) will make the AARs more effective. Battalion level leaders receive their preparation to

facilitate AARs first from experience then on professional education. This was reversed for company commanders and platoon leaders whose preparation to facilitate AARs comes from professional schooling followed by experience. Platoon sergeants were evenly divided between experience and education.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	Battalion Commanders believe in a VMT exercise, 41% of the training comes from AARs, 32% comes from execution, and 27% comes from preparation. Commanders believe AARs are extremely critical to VMT effectiveness (4.63 on a 5 scale). They feel AARs are effective (4.13 on a 5 scale). To improve AARs, Commanders recommend more participation, improved video feedback, more site staff participation, more standardized AARs, and an ability to show unit trends. The primary training to facilitate AARs reported by Commanders is OES (3 references) followed by local classes and Training Support Battalion/AC Advisor classes (2 each).
	Commanders report that training comes primarily form execution (40%) while 29% comes from preparation and 31% from the AAR. Commanders reported AARs as being very critical (4.26% on a scale of 5) but somewhat effective (3.86% on a scale of 5). Commanders received most of their training to conduct AARs from experience (14 references) followed by OC training (4 references) and OES (3 references). Five commanders reported no formal AAR training. Better trained facilitators and more time for the AAR were the two most mentioned ways to improve AARs.
BN S3	In a VMT exercise, S3s believe 38% of learning occurs in execution, 32% occurs in AARs and 30% occurs in preparation. S3s believe AARs are extremely critical (4.57 on a 5 scale). They believe AARs are effective (3.86 on a 5 scale). S3s list OES, local training, and experience as preparing them to conduct AARs (2 references each).
	S3s report that training comes primarily from execution (43%) while 31% comes from preparation and 26% comes from the AAR. S3s believe AARs are critical to the effectiveness of VMTs (4.08 on a 5 scale). They believe AARs are somewhat effective (3.72 on a 5 scale). S3s believe better trained facilitators will make AARs more effective (10 references), followed by better/more video playback (7), more time for AARs (2), and more AARs (2). Seven S3s stated they had no or little training to facilitate AARs. Preparation for facilitating AARs reported by S3s included experience (11 references), OES/NCOES (7), and local classes including ODP (7).
BN MG	Master Gunners believe 39% of training comes from execution, 34% from AARs and 27% from preparation. Master Gunners state AARs are critical to the effectiveness of VMTs (4.5 on a 5 scale). They believe AARs are effective (3.83 on a 5 scale). They say methods to make them more effective include better facilitation, more time for AARs, and shorter AARs. Master Gunners report their primary preparation to facilitate AARs is NCOES (3 references), and experience (2). Two Master Gunners report no preparation/training to facilitate AARs.
	Master Gunners report that 44% of learning comes from execution, 31% from preparation, and 25% from AARs. Master gunners believe AARs are extremely critical to the effectiveness of VMT exercises (4.63 on a 5 scale). They believe AARs are effective (4.25). They recommend more participation and better facilitators (3 references each) to make AARs more effective. Four Master Gunner respondents reported no or little training to facilitate AARs. Six reported experience as training them for AARs. There were two references each to the Master Gunners course and to NCOES.

CO CDR	Company Commanders believe that 49% of the training occurs during execution, 25% during AARs, and 23% during preparation. They believe AARs are critical to VMT effectiveness (4.19 on a 5 scale) and are effective (4). To improve AARs they would have better facilitation, provide examples of success, provide crew level audio/video, and get more participation. Commanders report that primarily OES has prepared them to facilitate AARs (4 references) followed by experience (1). Two Company Commanders stated they had no preparation/training to facilitate AARs.
	Company commanders believe 48% of learning comes from execution while 27% comes from the AAR and 25% from preparation. Commanders report that AARs are critical to VMT effectiveness (4.16 on a 5 scale). They state that AARs are somewhat effective (3.79 on a 5 scale). In order to make AARs more effective, commanders would like to see first better facilitation (14 references) followed by better video/audio support/playback (6), more time (5), better participation (5), and better post-AAR implementation of lessons learned (4). Commanders report that their preparation to facilitate AARs comes primarily from OES (22 references) followed by experience (12), local classes/OPDs (12) OC certification (5) and doctrinal manuals (3). Six commanders reported they had no preparation to conduct AARs.
PLT LDR	Platoon Leaders believe that 48% of the training occurs during execution while 32% occurs during preparation and 28% during AARs. Platoon Leaders believe that AARs are critical to VMT effectiveness (4.13 on a 5 scale) and are somewhat effective (3.92). To make AARs more effective, Platoon Leaders recommend better facilitation, more time for AARs, digital take home video/packets, more video replay, and more mission focus. Three Platoon Leaders state they have received no training to facilitate AARs. Other Platoon Leaders state their training/preparation to facilitate AARs included local class/OPDs (3 references) and experience and OES (2 each).
	Platoon leaders state that 48% of training occurs during execution, 26% in the AAR, and 26% in preparation. Platoon leaders believe AARs are critical to the effectiveness of VMTs (4.1 on a 5 scale). They believe AARs are somewhat effective (3.79 on a 5 scale). Platoon leaders believe better facilitation would make AARs more effective (7 references) followed by more video (6), more time for AARs (5), allowing immediate repeats of the exercise (5), more participation (5), better electronic take home packages (4), less time for AARs (4), more criticism in the AAR (4) and less criticism in AARs (2). Platoon leaders state their training to facilitate AARs comes from OES (33 references), followed by experience (22) and local classes/OPDs (16). Fifteen platoon leaders stated they had no training to facilitate AARs.
PLT SGT	Platoon Sergeants believe that in a VMT exercise, 52% of the training comes from execution while 26% comes from AARs and 22% comes from preparation. They believe AARs are critical to VMT exercises (4.26 on a 5 scale) and are effective (4.21). To make them more effective they recommend more audio/video feedback, more participation, and allowing more time for exercise interactions (2 references each). Sergeants state their preparation/training to facilitate AARs comes from NCOES (5 references) followed by experience (3). Two Platoon Sergeants stated they had no preparation/training to facilitate AARs.
	Platoon sergeants reported that in a VMT exercise, 23% of the training occurs during preparation, 50% during execution, and 27% during the AAR process. Platoon sergeants believe AARs are critical to the effectiveness of VMTs (4.14 on a five scale). Platoon Sergeants believe AARs are somewhat effective (3.83 of a five scale). Recommendations to make AARs more effective include: better training/more experienced facilitators (21 references), more discussion in AARs (20), more video playback (15), more time for AARs (8), showing individual vehicle views (6), and better follow through after AARs (5). Thirty five platoon sergeants reported they had little or no preparation or training to facilitate AARs. Of those reporting preparation or training, this included experience (55 references), NCOES (50), local class room training including NCODP (32) and OC training (8).
AC ADV	AC Advisors believe in a VMT exercise, 42% of the learning occurs in execution, 31% in AAR, and 27% in preparation. They believe AARs are critical to the effectiveness of VMTs (4.1 on a 5 scale). They believe AARs are marginally effective (3.8 on a 5 scale). Methods to improve AARs include better facilitation, mandatory AARs, better training management, more time for AARs, time to repeat the exercise, and better video playback capability.

TADSS Facilitators/ COTA	TADSS facilitators and COTAs believe that in a VMT exercise, 42% of the training occurs in the AAR, 40% in execution, and 18% in preparation. They believe that AARs are extremely critical (4.82 on a 5 scale) and they are effective (4.18). To improve AARs, they recommend better facilitation (2 references).
Site Staff	Site staff believes that in a VMT exercise, 40% of training comes from execution, 34% comes from preparation, and 26% from AARs. Site staff believes AARs are extremely critical to the effectiveness of VMTs (4.73 on a 5 scale). Staff reports that AARs are effective (4.36). To improve AARs, staff recommends better trained facilitators, more video playback, linking audio to video, digital take home packages, and limiting AARs to 20 minutes.

ISSUE 2: How does training in VMTs prepare units for operational environments?

FINDING: Training in VMTs does not prepare units for the operational environment. There is not a linkage between VMTs and the current operational environment. ARNG units are adapting their training with unique ways to use VMTs. However, systems and scenarios available are not sufficient to leverage current VMT capabilities to prepare units for OIF.

SUBISSUE 2.1: Are units using standard TSPs or have unique scenarios been created by unit, by CLS contractor, or by higher commands?

SUBISSUE 2.1 FINDING: Units are not using standard TSPs. Approximately half of respondents are not familiar with the term "TSPs." This included AC Advisors, TADDS Facilitators and site staff. The only position that was familiar with the term was Battalion Master Gunner. One-third of respondents report using TSPs. These TSPs come from a variety of sources. The lower echelon respondents reported that TSPs come from battalion. CCTT site staff is the leading single source of TSPs though respondents obtain TSPs more from other sources combined: AKO/digital library, AC Advisors, and doctrinal manuals; than from the CCTT site staff. Predominantly, battalion staffs are the source of VMT scenarios, followed by company commanders and site staff. Site staff is most often cited as the primary resource for assisting units with preparation for training.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	62% of Battalion Commanders report using TSPs to develop VMT training. 12.5% were not aware of the term "TSPs" even after some coaching. The source of TSPs they use is site staff (2 references) followed by doctrinal manuals, unit records, and Training Support Battalions. They report the S3 staff and Master Gunners develop their VMT scenarios (3 references each).
	43% of battalion commanders are not familiar with the term "TSPs." 38% of battalion commanders use TSPs. Commanders report getting TSPs from AC advisors and doctrinal manuals, in order. No commander reported getting TSPs from VMT staff; however eight commanders reported site staff developing or assisting with developing training scenarios. Predominantly, battalion staff develops training scenarios followed by battalion commanders, VMT site staff, company commanders, and AC advisors.

BN S3	43% of S3s report using TSPs to develop VMT training. 29% were not familiar with the term "TSPs" even after coaching. The source of TSPs are site staff (2 references) followed by Training Support Battalions, the S3, and doctrinal manuals. S3s report they develop VMT scenarios (3 references) followed by battalion staff (2), Training Support Battalions and company commanders.
	44% of S3s are not familiar with the term "TSPs." Of those familiar with the term, 37% state they use TSPs. Sources of TSPs include: site staff (5 references), doctrinal manuals (3), and training support battalions/AC Advisors (2). S3s report battalion staffs develop VMT training scenarios (23 references) followed by site staffs (9) and company staffs (4).
BN MG	67% of Master Gunners use TSPs to develop VMT training. The source of these TSPs is site staff (2 references) followed by doctrinal manuals and battalion staff. Master Gunners report that S3s develop training scenarios (3 references) followed by site staff, and battalion commanders (2 each).
	10% of Master Gunners were not familiar with the term "TSPs." 75% reported they used TSPs. Master Gunners predominantly get them from doctrinal publications (2 references), AC Advisors (2), Center for Army Lessons Learned, institutional schools, and AKO/digital library. One Master Gunner stated he gets TSPs from site staff. Master Gunners report that VMT scenarios are developed by S3s predominantly (8 references) followed by Master Gunners (6), company commanders/staff (4), and higher HQ (2).
CO CDR	50% of Company Commanders were not familiar with the term "TSPs." 38% stated they did not use TSPs to develop VMT training. Those that used TSPs stated the TSPs came from site staff and battalion staff. Commanders stated that battalion staff developed VMT scenarios (9 references) followed by company commander/staff and site staff (5 each).
	50% of company commanders are not familiar with the term "TSPs." 28% report using TSPs to develop VMT training. The primary source of these TSPs is site staff (6 references) followed by AKO/digital library (5), higher HQs (3) and Center for Army Lessons Learned and AC Advisors (2 each). Commanders report that company commanders/staff develop their VMT scenarios (29 references), followed by battalion staff (26), and site staff (23).
PLT LDR	68% of Platoon Leaders are not familiar with the term "TSPs." 12% report using TSPs to develop VMT training. Sources of TSPs are doctrinal manuals, battalion staff, OCs, and site staff. Battalion staff (7 references) develops VMT scenarios followed by company staff (4), ICs and site staff (3 each).
	53% of platoon leaders were not familiar with the term "TSPs." 25% of platoon leaders said they used TSPs to develop VMT training. The source of these TSPs were company commander/staff and doctrinal manuals (6 references each), followed by battalion staff (4), AKO/digital library (3), other units (2) and site staff (2). Platoon leaders stated the battalion staff predominantly developed VMT scenarios (31 references) followed by company commander/staff (27), site staff (19), and platoon leaders (10).
PLT SGT	40% of Platoon Sergeants were not familiar with the term "TSPs." 37% stated they used TSPs to develop VMT training. The source of these TSPs is battalion staff (3 references) followed by site staff (2). Sergeants state VMT scenarios are developed by company master gunners (7 references) followed by company commanders/staff and battalion master gunners (6 each) and site staff (4).
	29% of platoon sergeants reported using TSPs. 52% of were not familiar with "TSPs." Sources for TSPs included: manuals or SOPs (22 references), higher HQ guidance (11), Army schools/centers (9), AKO or digital libraries (5), and Training Support units/AC Advisors (3). Only one platoon sergeant reported getting TSPs for site staff. Sergeants reported that scenarios are developed by battalion command and staff (63 references). Other developers include: company command and staff (42), site staff (22), platoon leadership (16), brigade or higher staff (9), and instructors (7).

AC ADV	50% of AC Advisors were not familiar with the term "TSPs." 30% stated their units use TSPs to develop VMT training. The sources of these TSPs are doctrinal manuals, schools, and higher HQ. AC Advisors stated battalions staffs develop VMT scenarios (5 references) followed by company staffs (3) and Training Support Battalions/Brigades/AC Advisors (2).
TADSS Facilitators/ COTA	50% of TADSS facilitators and COTAs say they use TSPs to develop VMT training. 36% are not familiar with the term "TSP." They say the sources of their TSPs are schools (2 references), Training Support Battalions/AC Advisors and doctrinal manuals. They say site staff (4 references) develops VMT scenarios followed by battalion staff (4), and Training Support Battalions/AC Advisors (2).
Site Staff	50% of site staff are not familiar with the term "TSPs." 43% use TSPs to develop VMT training. Staff report the source of TSPs includes Force XXI Training Program, unit SOPs, doctrinal manuals, institutional schools, Army standards, and site staff (1 reference each). Site staff report that unit trainers develop VMT scenarios (3 references) followed by site staff (2).

SUBISSUE 2.2: What skill sets supported by VMTs are critical to success in theater? Which critical tasks are not supported?

SUBISSUE 2.2 FINDING: VMT supported skill sets have not been critical to success in theater. Less than half of ARNG units have received or created an OIF specific task list. Approximately 60% have created an OIF specific training strategy. One-third of OIF veterans report that OIF training prior to deployment matched their experiences in Iraq. Battalion level leaders state useful pre-deployment VMT training included convoy operations and leader skills. Company and platoon level leaders state useful training included maneuver and leaders training. High-intensity conflict (HIC) tasks trained in VMTs were not useful in Iraq. A small percentage of respondents reported that time spent training high-intensity tasks was detrimental, due to it taking time away from other, more relevant training. However, the vast majority of respondents stated that VMTs have no detrimental impact or cause negative training.

Note: No respondent from the physical collection had been to nor had orders for Iraq.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	25% of Battalion Commanders report receiving an OIF specific task list and 38% report developing or modifying an OIF specific task list.
	50% of battalion commanders report receiving an OIF specific task list. 46% report developing or modifying an OIF specific task list. 64% report preparing an OIF specific training strategy. Twenty four commanders reported their units going to or on orders to deploy to OIF. 38% of these reported that OIF specific tasks trained on prior to deployment matched what they experienced. Critical training in VMTs included leader tasks and convoy operations. Four commanders reported that no task trained in VMTs was critical to success. High intensity combat, non-urban terrain, and main gun engagements were tasks reported as trained in VMT which had no relationship to their OIF experience. Two commanders reported VMT training had no relationship. Commanders did not perceive negative training from VMT; though one reported loss of training time to VMTs had a negative impact on OIF performance.

BN S3	14% of S3 report their unit has received an OIF specific task list. 43% report developing or modifying an OIF task list. 14% report their units have prepared an OIF training strategy.
	45% of S3s report receiving an OIF task list. 42% report developing or modifying an OIF task list. 60% report preparing an OIF specific training strategy. 49% of OIF experienced S3s report that OIF specific tasks trained on prior to deployment matched what they experienced in Iraq. Training conducted in VMTs that was critical to success in Iraq include: convoy operations (4 references) and command and control/planning/troop leading procedures (2). Two S3s reported that none of the training received in VMTs was critical to unit success. Training that had no relationship to OIF included: high intensity conflict tactics (4) and gunnery (2). Four S3s reported that none of their VMT training had no relationship. S3s reported that no training in VMTs had a detrimental or negative effect (14 references). One S3 stated that the HIC focus was detrimental.
BN MG	17% of Master Gunners report receiving an OIF specific task list from a higher command. 67% report their unit has developed or modified an OIF specific task list. 67% report their unit has prepared an OIF training strategy.
	39% of Master Gunners report their units have received an OIF specific task list. 35% report developing or modifying an OIF task list. 59% report their units have developed an OIF training strategy. 35% of Master Gunners with OIF experience report that OIF tasks trained on prior to deployment matched what they experienced in Iraq. Most Master Gunners (5 references) reported that no VMT training was critical to OIF success. Master Gunners report that convoy operations (3 references) and collective maneuver training (2) in VMTs was critical to unit success. Master Gunners reported that tank/Bradley tasks and high intensity conflict tasks were not critical to OIF success (3 references each) while most (6) reported no training had no relationship. Master Gunners reported that no VMT training had negative impact.
CO CDR	35% of company commanders with OIF experience report that OIF tasks trained on prior to deployment matched what they experienced in Iraq. Thirteen commanders reported that no VMT training was critical to their success in Iraq. VMT training that was critical included leader skills (7 references), gunnery (4), crew training (4), actions on contact (3), and unit cohesion (2). VMT training that had no relationship to OIF included high intensity conflict and armor tasks (14 references), all (13), gunnery (3) and company and higher training (2). Five commanders reported that all training had a relationship. Commanders reported that there was not any VMT training which was detrimental or OIF success, though one commander stated that loss of training time was detrimental.
PLT LDR	35% of platoon leaders with OIF experience report that OIF specific tasks trained on prior to deployment matched what they experienced in Iraq. They stated maneuver training (7 references), command, control, and communications training (5), convoy operations training (3) and situational awareness training (2) was critical to their unit success. Twenty six platoon leaders stated no training in VMTs was critical to unit success. VMT training not critical to unit success included all and high intensity conflict training (15 references each), gunnery (4), and defensive operations (3). Platoon leaders stated VMT had no detrimental or negative training impact, other than four platoon leaders who stated time spent in VMTs limited time for other training.
PLT SGT	33% of platoon sergeants reported that OIF specific tasks trained on prior to deployment matched their experience in Iraq. VMT training reported as critical included: none (51 references), convoy operations (15), maneuver tasks (9), and MOUT operations (7). Many of the sergeants who state no VMT training was critical trained as an armored or mechanized unit and then operated as a motorized unit. VMT training that had no relation to OIF included: none (32 references), all (14), high intensity operations (10), armor operations (5), scenarios (4), and defend (2). Negative or detrimental training reported included: none (75 references), focus on high intensity conflict versus current operating environment (11), and vehicle models different than used in OIF (6).
AC ADV	60% of AC Advisors report their units received an OIF specific task list. 44% report their units developed or modified an OIF task list. 50% reported their units prepared an OIF training strategy.
TADSS Facilitators/ COTA	45% of TADSS Facilitators and COTAs have received an OIF task list, have developed or modified an OIF task list, and/or prepared an OIF specific training strategy.

Site Staff	23% of site staff report receiving an OIF specific task list. 58% report developing or modifying an OIF task list. 40% report that OIF training matched conditions experienced in Iraq. Staff report fire control and ROE training was critical to unit success in Iraq. They report that no training had no relationship (1 answer) and no training was detrimental (1 answer).

SUBISSUE 2.3: Are there innovative training approaches being employed by CLS, units, or higher commands that can be promulgated?

SUBISSUE 2.3 FINDING: The ARNG is using VMTs in many unique ways, most of which expand the training horizon. This is done through linking VMTs to other live and constructive training, through using the tether function of VMTs, or by training non-traditional training audience. To better use VMTs to train for OIF, respondents recommend matching tasks and conditions as much as possible to the Current Operational Environment. A task specifically cited was training convoy operations. Conditions cited include mirroring threat tactics, techniques, and procedures and making the virtual environment match the anticipated operational environment.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	Battalion Commanders report the following unique ways to use VMTs: -Using them to validate company and platoon leaders -Using them to conduct convoy operations training.
	Unique uses for CCTT mentioned include: Using CCTT for gunnery • Integrating mortars and medics into training (3 references) • Transitioning from armor to light infantry • Integrate Air Cavalry assets • Joint training with USMC • Officer/leader validation (2 references) • Combined Arms operations • Convoy training ○ Convoy scenario with civilian vehicles and VBIED. ○ Scenario where convoy runs over child • Training drivers from Support Platoon • Linking CCTT to JANUS (2 references) • BN 'King of the Hill" competition Recommended uses for CCTT to prepare units for OIF include: VMTs need to be the same equipment that will be used in OIF. • Use of COE in the VMT environment. • Junior officer and NCO decision making • Need to integrate more motorized tasks and small arms training with shoot/don't shoot situations. Especially with Blue forces using SUVs on main roads. More Blue on Blue units firing on Coalition forces using SUVs. • VMT must be adapted to the OIF environment: Urban, IEDs, VBIEDs, snipers/RPG, and civilian interaction.
BN S3	S3s report the following unique uses of VMTs: -Conducting convoy security operations. -Train support platoons on convoy operations.
	Some of the more unique ways S3s have seen VMTs used include: -Battalion maneuver in CCTT using the TOC, company commanders, and tethered platoons. -Using VMTs to train newly assigned Soldiers and leaders. -Injecting MSELs into VMT training. -Training junior leaders to perform two levels up. Ways S3s would use VMT to prepare units for OIF include: more convoy operations (6 references), more dismounted training (4), and more complex urban terrain environment training (3).
BN MG	Master Gunners report the following unique VMT usage: -Modifying target array to simulate tank ranges and tables.
	Master Gunners report the following innovative uses of VMTs: -Execute a HMMWV/motorized scenario using Bradley simulators. New ways Master Gunners would use VMTs to prepare for OIF include convoy operations training (4 references) followed by urban terrain training (2).

CO CDR	• Company Commanders report seeing one unique use of VMTs: training non-tankers in VMTs to develop leader confidence and build teams. • Company commanders report the following unique VMT usages: -Company level leader training with platoon leaders and commanders in tanks and platoon sergeants running tethered platoons from god screens. -Using CCTT to practice mounted land navigation in urban areas. -Participated in a brigade FTX in which one battalion was maneuvering in the field and another was in CCTT maneuvering on adjacent terrain. Commanders the following uses of VMTs for units deploying to OIF: train convoy operations (7 references), use realistic threat TTP (7), do MOUT training (6), train leader/staff skills (6), train HMMWV operations (5), and use realist scenarios/missions (5).
PLT LDR	• The only unique use of VMTs reported by Platoon Leaders was its use to evaluate leaders. • Platoon leaders have seen the following unique ways to use VMTs: -Wargaming possible outcomes -Drivers training Platoon leaders with OIF experience recommend the following ways to use VMTs to prepare for OIF: more realistic scenarios (19 references), tailoring training to actual AOR (9), and more realistic threat (9).
PLT SGT	• The only unique use of VMTs reported by Platoon Sergeants is the use of them during AT down time. • Some innovative VMT training approaches reported by platoon sergeants include: • Scenarios based on upcoming lanes training • Used during gunnery tables to maintain crew skills • Cross training of junior Soldiers (dismounts/loaders/drivers) (six separate reports) • MOUT training (two separate reports) • Pitting platoons against each other instead of a SAF • Recruiting • Used to support senior leaders training (platoon execute plan and then view in AAR) • Creating tank-Brad hunter killer teams • Doing call for fire • Convoy operations (including non-combat arms units) x2 • Threat vehicle ID • Cross training other MOSs • Train non-mechanized units on how mechanized units operate • Land navigation Recommended uses to prepare units for OIF include: make more available (17 references), use for MOUT training (16), use OIF specific scenarios (14), use for IDE/VBIED training (14), use for dismounted operations (7), put in more civilians (6), and use for convoy operations training (6).
AC ADV	• No AC Advisor reports observing an unique use of VMTs.
TADSS Facilitators/ COTA	• TADSS Facilitators and COTAs have reported linking VMTs with tabletop trainers to create convoy operations training. They recommend using VMTs for ROE training.
Site Staff	• Site staff reported a unique way of using VMTs was to combine them with live or virtual training. Site staff recommended using VMTs to prepare units for OIF by reinforcing ROE, training fire control, and training on identifying IEDs and ambush sites.

ISSUE 3: Do current policies and operating schedules for VMTs adequately support user needs?

FINDING: Current policies and operating schedules for VMTs adequately support user needs. The number and location of VMTs are limiting factors in their use. However, VMT schedules provide access when needed. Disruptions to training plans/schedules are moderate.

SUBISSUE 3.1: Are systems fully utilized?

SUBISSUE 3.1 FINDING: See Macro-Level Analysis below.

SUBISSUE 3.2: Do units have adequate access?

SUBISSUE 3.2 FINDING: Less than one-third of respondents feel there are sufficient VMTs to meet training needs. These numbers are lower at the company and platoon levels. The biggest limiting factor is the long distances to training sites, followed by the number of systems available.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	62% of Battalion Commanders report there are sufficient VMTs available to meet training needs. The most significant factor limiting VMT availability is location and scheduling conflicts with other units (3 references each).
	37% of battalion commanders report sufficient VMTs are available to meet their training needs. The most reported limiting factors was system availability, location of or distance to systems, funds, time availability, scheduling, and conflicts with higher priority units.
BN S3	86% of S3s report sufficient VMTs are available to meet training needs. S3s report the most significant factor limiting VMT availability is location/distance (2 references) followed by system availability, mobilizations, and scheduling conflicts with other units.
	28% of S3s report there are sufficient VMTs available to meet training needs. The most significant factor that limits VMT availability is location/distance (15 references) followed by scheduling (including conflicts with other units) (10), time availability (6), funding (4), and number of systems (4).
BN MG	33% of Master Gunners report sufficient VMTs are available to meet training needs. The primary factor in limiting VMT availability is scheduling (4 references) followed by location, system availability, maintenance, and funding. One Master Gunner reported there are no tasks they cannot train.
	35% of Master Gunners report there are sufficient VMTs available to meet training needs. The most significant factor that limits VMT availability is distance/location and system availability (3 references each), followed by time availability (2), and scheduling (2).
CO CDR	56% of Company Commanders report there are sufficient VMTs to meet training needs. They say the most significant factor limiting VMT availability is location/distance (7 references) followed by time availability (5) and scheduling conflicts with other units (2).
	29% of company commanders report there are sufficient VMTs to meet their training needs. The most significant factor that limits VMT availability is location/distance (25 references), followed by time availability (15), schedule conflicts (13), system availability (11) and funding (9).
PLT LDR	50% of Platoon Leaders report that there are sufficient VMTs available to meet training needs. The most significant factor limiting VMT availability is time availability (10 references) followed by system availability and location/distance (5 each) and funding (3).
	20% of platoon leaders report there are sufficient VMTs available to meet training needs. Platoon leaders report the most significant factor limiting VMT availability is location/distance (25 references), followed by funding (24), time availability (22), system availability (17), maintenance (7), and trained operators (6).
PLT SGT	37% of Platoon Sergeants report that there are sufficient VMTs available to meet training needs. They report the most significant factor limiting VMT availability is distance/location (14 references) followed by time availability (8) and other missions (4).
	26% of platoon sergeants report that there are sufficient VMTs to meet training needs. Significant factors that limit VMT availability include: number of systems available (47 references), location/distance (44), time availability (44), scheduling conflicts (including conflicts with other units) (24), funding (21) leaders' attitudes (8), system maintenance (8), and number of trained operators (7).
AC ADV	40% of AC Advisors report there are sufficient VMTs to meet training needs. They report the most significant factors limiting VMT availability are systems available, time availability, and funding (3 references each).

TADSS Facilitators/ COTA	27% of TADSS Facilitators and COTAs believe there are sufficient VMTs to meet training needs. The most significant factors limiting VMT availability are staff and number of systems (2 references each).
Site Staff	Site staff report that the most significant factors limiting VMT availability are system availability, unit knowledge of system, units not requesting system, trained operators, scheduling conflicts, and unit time available.

SUBISSUE 3.3: Do VMT schedules drive unit training strategies and plans or do plans determine VMT scheduling?

SUBISSUE 3.3 FINDING: VMTs schedules impact unit training strategies and plans but that impact is not large. Two-thirds of respondents state VMTs provide access when needed. Slightly more mobile VMT users than fixed users report VMTs provide access when needed (62% versus 59%). VMT location or proximity has a negative impact on training. Mobile users report a slightly less negative impact than fixed users (2.75 versus 2.69 on a scale of 5). One-third report having had to change a training schedule to take advantage of unplanned VMT availability. One-quarter to one-half of respondents report having to cancel a VMT exercise due to a change in VMT scheduling.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	88% of Battalion Commanders report that VMT scheduling provides access when needed to support training schedules. 86% report that their unit has taken advantage of unexpected VMT availability. 25% report that their unit has been required to change its training schedule to take advantage of unexpected VMT availability. 50% report that a change in the VMT schedule has caused their unit to cancel a VMT exercise. They state the biggest challenge to training in a VMT is time availability (4 references) followed by location/distance (3). Commanders report that battalion staff coordinates VMT use (4 references) followed by Master Gunners/Operations SGMs. Commanders report that location or proximity of VMTs has a negative impact on their training (2.88 on a 5 scale).
	63% of battalion commanders report VMT scheduling provides access to support unit training schedules. 64% have taken advantage of unexpected VMT availability. 41% have been required to change a training schedule to take advantage of unexpected VMT availability. 42% report having to cancel a VMT exercise due to a change in VMT scheduling. System availability, distance/location, time conflicts, scheduling, and preparation are reported as the biggest challenges to VMT training, in order. Commanders reported BN S3s, master gunners, staff primarily schedule VMTs. Distance to a VMT adversely affects training (2.55 on a 5 scale).

BN S3	All S3s report VMT scheduling provides access when needed to support training schedules. 86% have taken advantage of unexpected VMT availability. 29% report their unit has been required to change its training schedule to take advantage of unexpected VMT availability. No S3 reported that a change in VMT schedule caused their unit to cancel a VMT exercise. S3s report the biggest challenge to train in a VMT is time availability (3 references) followed by system availability, system familiarization, and getting used to virtual environment. S3s report that battalion training officers (3 references) followed by S3 staff coordinate VMT use. VMT location/proximity has a positive impact on VMT training.
	66% of S3s state VMT scheduling provides access when needed to support their training schedule. 53% report their unit taking advantage of unexpected VMT availability. 39% report being required to change their training schedule to take advantage of unexpected VMT availability. 33% report canceling a VMT exercise due to a change in VMT scheduling. The biggest challenge to train in a VMT is travel/location (7 references) followed by availability (6), pre-exercise preparation (4), and time availability (4). S3s report they coordinate VMT use (14 references), followed by battalion master gunners or operations NCOs (12) and other battalion staff (11). Distance to a VMT adversely affects training (2.61 on a 5 scale).
BN MG	67% of Master Gunners report that VMT scheduling provides access when needed to support training schedules. 83% report their unit has taken advantage of unexpected VMT availability. 33% report their unit has been required to change training to take advantage of unexpected VMT availability. 17% report their unit has been required to cancel a VMT exercise due to a VMT schedule change. They report the biggest challenges to train in a VMT are transportation, system availability, time availability, system maintenance, and crew turbulence. Master Gunners report they primarily coordinate VMT use (3 references) followed by battalion staff. They say that the location/proximity of VMTs has a positive impact on training (3.67 on a 5 scale).
	67% of Master Gunners report that VMT scheduling provides access when needed to support training schedules. 56% report their units have taken advantage of unexpected VMT availability. 44% report their units have been required to change their training schedule to take advantage of unexpected VMT availability. 37% report that a change in VMT schedule has caused them to cancel a VMT exercise. The biggest challenge to train in a VMT is time availability (5 references) followed by distance/location/logistics (3) system familiarization (3) and personnel availability (2). Master Gunners report that they coordinate VMT use (8 references) followed by BN S3 staff (7), and S3s (2). Proximity has a negative impact on VMT use (2.75 on a 5 scale).
CO CDR	62% of Company Commanders state VMT scheduling provides access when needed to support training schedules. 59% report their unit had taken advantage of unexpected VMT availability. 53% report their unit had been required to change its training schedule to take advantage of unexpected VMT availability. 44% report canceling a VMT exercise due to a change in VMT scheduling. The biggest challenge to training in a VMT is distance/location/travel (5 references) followed by preparation (3) and terrain association/navigation, conflicting requirements, and scheduling (2 each). Commanders report that battalion staff coordinates VMT use (6 references) followed by the battalion S3 (5) and company staff (3). Commanders state that the location/proximity of VMTs has a negative impact on their use (2.18 on a 5 scale).
	56% of company commanders report that VMT scheduling provided access when needed to support training objectives. 68% report their units taking advantage of unexpected VMT availability. 53% report their unit was required to change its training schedule to take advantage of unexpected VMT availability. 36% of commanders report canceling a VMT exercise due to a change in VMT scheduling. The biggest challenge to train in a VMT is distance/location (5 references) followed by exercise preparation (3), navigation within the exercise (2) conflicting requirements (2), and scheduling (2). Commanders report that battalion staff coordinate VMT use (34 references) followed by company commander/staff (23). The proximity of VMTs has a negative impact on VMT use (2.41 on a 5 scale).

PLT LDR	61% of Platoon Leaders state VMT scheduling provides access when needed to support training schedules. 65% report their units taking advantage of unexpected VMT availability. 52% report their units being required to change its training schedule due to unexpected VMT availability. 26% report that a change to VMT schedule has caused their unit to cancel a VMT exercise. Platoon Leaders report the biggest challenge to train in a VMT is time availability (8 references) followed by system availability (4) and personnel availability (2). Platoon Leaders state that the location/proximity of VMTs has no impact on training (3 on a 5 scale).
	50% of platoon leaders report VMTs provide access when needed. 59% report their unit has taken advantage of unexpected VMT availability. 36% report that their unit has been required to change its training schedule to take advantage of unexpected VMT availability. 29% report that a change to the VMT schedule has forced them to cancel a VMT exercise. Platoon leaders report the biggest challenge to train in a VMT is availability of systems (20 references) followed by availability of time (11), getting used to a virtual simulator (9) and location/distance (9). Platoon leaders report that proximity or distance has a negative impact on VMT use (2.64 on a 5 scale).
AC ADV	40% of AC Advisors report VMTs provide access when needed to support training schedules. 40% report their units have taken advantage of unexpected VMT availability. 30% report their units have been required to change their training schedules to take advantage of unexpected VMT availability. 22% reported a change in the VMT schedule has required them to cancel a VMT exercise. The biggest challenge to train in a VMT is knowing/learning the system (5 references) followed by time availability (4). AC Advisors report battalion staffs and company staffs coordinate VMT use (4 references each). They say VMT location/proximity has a negative impact on VMT use (2.5 on a 5 scale).
TADSS Facilitators/ COTA	67% of TADSS Facilitators and COTAs believe VMT scheduling provides access when needed to support training schedules. 78% have seen units take advantage of unexpected VMT availability. 30% have seen units required to change their training schedules to take advantage of unexpected VMT availability. 40% have seen units cancel a VMT exercise due to VMT schedule changes. They say the biggest challenge to train in a VMT is scheduling. They say brigade or higher coordinate VMT use (4 references) followed by battalions (3) and companies (2). They say that location or proximity has a slightly positive impact on VMT use (3.67 on a 5 scale).
Site Staff	All (100%) of site staff report VMT scheduling provides access when needed to support training schedules. 67% of staff report that units have take advantage of unexpected VMT availability. 30% report units have been forced to change their training schedules to take advantage of VMT availability. Site Staff report the following challenges to train in a VMT: units trying to do too many things at the same time, lack of unit preparation, system breakdowns, communicating time available, and motivation. Site Staff report that VMT proximity has a positive impact on training (3.5 on a 5 scale).
Mobile VMT Users	62% of mobile VMT users report VMTs provide access when needed to support training schedules. The proximity of VMTs has a negative impact on VMT use (2.75 on a 5 scale).
Fixed VMT Users	60% of fixed VMT users report VMTs provide access when needed to support training schedules. The proximity of VMTs has a negative impact on VMT use (2.69 on a 5 scale).

ISSUE 4: Do the capabilities of VMTs meet user training requirements?

FINDING: Users are satisfied overall with the capabilities of their VMTs. They would like more availability, but not at the expense of realism. Users believe their VMTs are good at training individual through platoon level, but best at training crews. Although, wanting to keep a primary platoon focus to their VMT training, they would want the ability to also train at the company level. This implies a desire for a system-level VMT capability to train at the company level.

SUBISSUE 4.1: At what echelons are VMTs used and why?

SUBISSUE 4.1 FINDING: VMTs are being used primarily at platoon level but also to train at crew and company level. Unit leaders believe VMTs provide the best training for crews followed by individuals. The only exception are Battalion Master Gunners, who believe VMTs are best at training platoons followed by crews. Respondents do not believe VMTs are good trainers of companies and battalions.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	All Battalion Commanders report that they have seen platoon training on VMTs. 75% report seeing crew training while 25% report company and 12% report battalion training. Commanders believe VMTs best train crews followed by individuals and platoons. They believe VMTs do not well train companies and poorly train battalions.
	Battalion commanders have seen primarily crew (82%), platoon (77%) and company (64%) training occur in VMTs. Commanders believe VMTs best train crews (3.81 on a 5 scale) and then individuals (3.54) and platoons (3.41). Commanders rate poorly VMT training for companies (2.76) and battalions (2.3).
BN S3	100% of S3s have seen VMTs used to train crews and platoons. 71% have seen them train companies and 14% have seen them train battalions. S3s believe VMTs best train crews (4.29 on a 5 scale) followed by individuals (3.86), and platoons (3.71). They believe VMTs do not train companies (2.29) nor battalions (1.29) well.
	82% of S3s have seen crew training conducted on VMTs, while 79% have seen platoon, 71% have seen company, and 39% have seen battalion training conducted. S3s believe VMTs best train crews (3.82 on a 5 scale) followed by individuals (3.53) and platoons (3.45). S3s believe VMTs are less suitable to companies (2.68) and battalions (2.29).
BN MG	All Master Gunners have seen crew and platoon training in VMTs. 67% have seen company training and 17% have seen battalion training. They believe VMTs best train platoons (4.17 on a 5 scale) followed by crews (3.5) and individuals (3). The train less well companies (2.5) and battalions (1.83).
	94% of Master Gunners have reported platoon echelon training conducted in VMTs. 75% reported crew, 56% report company, and 19% report battalion level training in VMTs. Master Gunners believe VMTs best train platoons (4.06 on a 5 scale) followed by crews (4), and individuals (3.69). Master Gunners believe VMTs do not train companies or battalions well (2.5 and 1.88 respectively).
CO CDR	76% of Company Commanders have observed platoon training in VMTs. 65% have seen crew training while 41% have seen company and 12% have seen battalion. Commanders believe VMTs best train crews (4.24 on a 5 scale) followed by platoons (3.59), and individuals (3.53). Commanders believe VMTs are less well at training companies (2.12) and battalions (1.29).
	84% of company commanders have seen platoons train in VMTs. 80% have seen crews, 68% have seen companies and 24% have seen battalions. Commanders believe VMTs best train crews, followed by platoons and individuals. Commanders believe VMTs are less efficient at training companies and battalions.
PLT LDR	60% of Platoon Leaders have seen VMTs do crew level training. 56% have seen platoon level training, 28% have seen company, and 24% have seen battalion level training. Platoon Leaders believe that VMTs train crews best (4.08 on a 5 scale) followed by individuals (3.67) and platoons (3.54). Platoon Leaders believe VMTs are less well at training companies (2.67) and battalions (2.33).
	75% of platoon leaders have seen platoon training in VMTs. 71% have seen crew training, 52% company training, and 18% battalion training. Platoon leaders believe VMTs train crews well (3.81 on a 5 scale) followed by platoons and individuals. Platoon leaders do not think VMTs train companies (2.76) nor battalions (2.13) well.

AC ADV	■ 70% of AC Advisors have seen crew and platoon level training on VMTs. 60% have seen company level and 30% have seen battalion level. AC Advisors believe that VMTs best train platoons (3.33 on a 5 scale) but do not train well crews (2.33), individuals and companies (2.22 each), and battalions (1.67).
TADSS Facilitators/ COTA	■ 90% of TADSS Facilitators and COTAs have seen VMTs train platoons. 70% have seen them train crews. 60% have seen them train companies and 10% have seen them train battalions. They say VMTs are best at training platoons, followed by crews, and individuals. They say that VMTs do not well train companies followed by battalions.

SUBISSUE 4.2: Would more company and battalion level training be conducted if technology could support it?

SUBISSUE 4.2 FINDING: ARNG leaders prefer using VMTs to train platoons and crews. Guard units would conduct more company, but not more battalion level training. If given additional resources, respondents would first train platoons then crews and finally companies. This is true for both CCTT and SIMNET users, though CCTT users placed more emphasis on using their VMT for individual training than did SIMNET users. Guard leaders would invest limited training time (MUTAs) first in platoon and then crew level training. Overall, Guard units would train gunnery tasks followed closely by maneuver tasks. However, CCTT users would train maneuver tasks followed closely by gunnery tasks.

The below charts compare the investment in MUTAs mobile users would make versus fixed users and CCTT users would make versus SIMNET users. One MUTA is a half-day assembly/training period for one Soldier. Guard units normally have 48 MUTAs per Soldier per year, which they allocate to weekend IDTs.

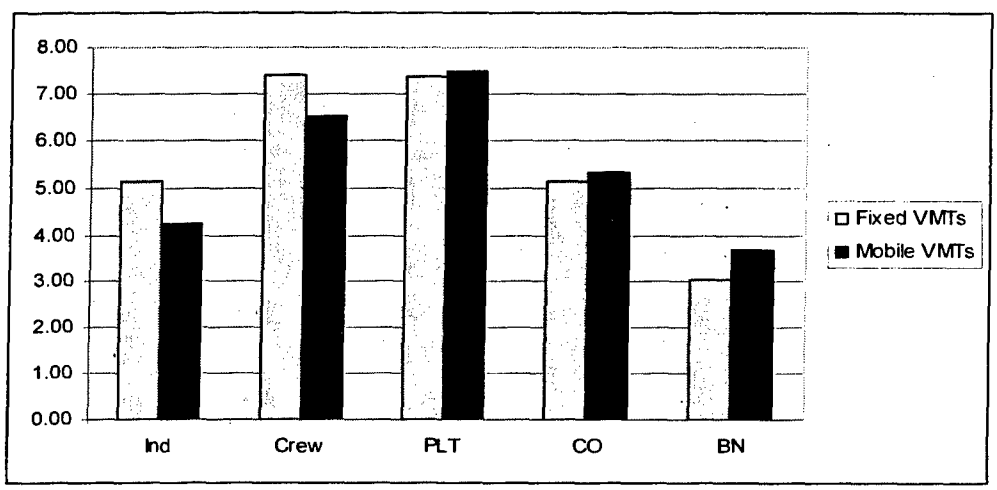

Figure 6. AVG MUTA investment by mobility

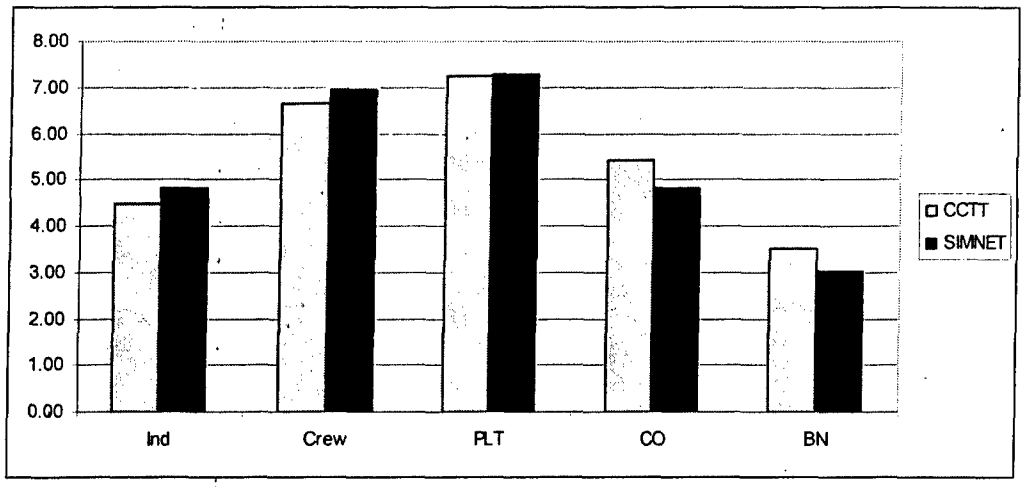

Figure 7. AVG MUTA investment by system

Investment of training time is an indicator of the relative importance users place in differing systems. Figure 6 compares fixed VMT users to mobile VMT users. The figure shows that both fixed and mobile users place most importance in platoon training, followed by crew. The figure also shows that fixed VMT users would invest more training in higher echelons, companies and battalions, than mobile users. Figure 7 compares CCTT and SIMNET users. Again, both CCTT and SIMNET users would invest more time training platoon tasks, followed by crew. The figure also shows that CCTT users would invest more training time in higher echelons than SIMNET users.

Position	Sub-Issue Finding by Position: ▪ Physical ▪ Web
BN CDR	If given additional access to VMTs, Commanders would first train crews and platoons, followed by companies, individuals, and battalions. They would train gunnery and maneuver followed by fire control, command and control, SOPs and communications. Commanders would invest time (MUTAs) first in platoon training (5) followed by crews (3.25), companies (3.13), individuals (2.25) and battalions (1.38).
	If given more access to VMTs, battalion commanders would first train platoons, then crews, individuals, companies and battalions, in order. Commanders would train gunnery first, maneuver, command and control, call for fire, communications, and SOPs, in order. Commanders would commit most training time (MUTAs) to platoons (5.22), crews (4.81), companies (3.89), individuals (3.28), and battalions (2.83), in order.
BN S3	If given additional access, S3s would first train platoons, followed by crews, companies, individuals and battalions. They would first train gunnery, followed by maneuver, fire control and command and control. They would invest time (MUTAs) first to train platoons (10.14), crews (9.86), individuals (6.29), companies (5.86), and battalions (5.57).
	If S3s were given more resources, they would first train platoons followed by crews, companies, individuals, and battalions (3.78). They would train command and control tasks followed by maneuver, gunnery, fire control, SOPs and communications, in order. They would commit most training time (MUTAs) to platoon training (10.14) followed by crews (9.86), individuals (6.29), companies (5.86) and battalions (5.57).

BN MG	If given additional VMT access, Master Gunners would train first platoons, followed by crews, companies, individuals, and battalions. They would train gunnery, followed by maneuver, fire control and communications, command and control, and SOPs. Master Gunners would commit time (MUTAs) most to platoons (12.5) then companies (5.33), crews (5.17), individuals (2.33) and battalions (2.17).
	If given additional resources, Master Gunners would first want to train platoons, followed by crews, individuals, companies and battalions. They would train maneuver tasks, followed by gunnery, command and control, SOPs, fire control, and communications. They would invest training time (MUTAs) most in platoons (12.5), then companies (5.33), crews (5.17), individuals (2.33) and battalions (2.17).
CO CDR	If given additional access to VMTs, Company Commanders would first train platoons, followed by crews, companies, individuals and battalions. They would first train fire control followed by command and control, maneuver, communications, and gunnery and SOPs. Commanders would invest most time (MUTAs) into training platoons (5) followed by individuals (4.14), crews (3.86), companies (3.29) and battalions (2.43).
	If given additional resources, company commanders would use them first to train platoons, followed by crews, companies, individuals, and battalions, in order. Commanders would train maneuver tasks, followed by gunnery, command and control, communications and fire control, and SOPs. Commanders would invest time (MUTAs) first training platoons (7.87), crews (5.6), companies (4.96), individuals (3.03), and battalions (2.66), in order.
PLT LDR	If given additional access to VMTs, Platoon Leaders would first train platoons, followed by crews, individuals, companies, and battalions. They would train gunnery followed by command and control, fire control, maneuver tasks, and SOPs and communications.
	If given more access to VMTs, platoon leaders would like first to train platoons followed by crews, companies, individuals, and battalions. Platoon leaders would use additional access to train first gunnery followed by maneuver, command and control, SOPs, fire control, and communications.
PLT SGT	If given additional access to VMTs, Platoon Sergeants would first train platoons, followed by crews, companies, individuals, and battalions. They would first train maneuver followed by gunnery, communications, command and control, fire control, and SOPs.
	If given more access to VMTs, platoon sergeants would place most priority on crew training, followed by platoon, individual, company, and battalion. Platoon sergeants would most like to train maneuver, gunnery, fire control, command and control, communications, and SOPs, in order.
AC ADV	If given additional access to VMTs, AC Advisors would first train crews and platoons, followed by individuals, companies, and battalions. They would train communications followed by command and control, gunnery, fire control, maneuver, and SOPs. They would invest time (MUTAs) first in crews (4.4), platoons (4.1), companies (2.7), individuals (2.2) and battalions (1.6).
TADSS Facilitators/ COTA	If given additional access to VMTs, TADSS Facilitators would first train platoons, followed by crews, companies, individuals, and battalions. They would first train maneuver followed by gunner and command and control, fire control and communications, and then SOPs.
Fixed VMT Users	Fixed VMT users would invest most time (MUTAs) into training crews (7.40) followed by platoons (7.38), companies (5.15), individuals (5.12), and battalions (3.04).
Mobile VMT Users	Mobile VMT users would invest most time (MUTAs) into training platoons (7.48) followed by crews (6.52), companies (5.31), individuals (4.26), and battalions (3.68).
CCTT Users	If given additional resources, CCTT users would use them first to train platoons, followed by crews, individuals, companies, and battalions, in order. CCTT users would train maneuver tasks, followed by gunnery, command and control, SOPs, communications, and fire control. CCTT users would invest most time (MUTAs) into training platoons (7.24) followed by crews (6.66), companies (5.43), individuals (4.14), and battalions (2.43).

SIMNET Users	If given additional resources, SIMNET users would use them first to train platoons, followed by crews, companies, individuals, and battalions, in order. SIMNET users would train gunnery tasks, followed by maneuver, command and control, communications, fire control, and SOPs. SIMNET users would invest most time (MUTAs) into training platoons (7.28) followed by crews (6.96), individuals (4.84), companies (4.83) and battalions (3.01).

SUBISSUE 4.3: Do the differences between the capabilities afforded by the available VMTs impact how they are used?

SUBISSUE 4.3 FINDING: Battalion level leadership and platoon sergeants believe that VMTs improve their confidence in their training proficiency, followed by confidence in their units. Company Commanders and Platoon Leaders believe VMTs best improve confidence in themselves, followed by confidence in their training proficiency. CCTT is better than SIMNET in improving users' confidence in themselves.

Respondents would not accept an improvement in realism if it meant less availability nor would they accept an increase in availability if it meant a decrease in realism. The desire to maintain realism is stronger than the desire to maintain availability. CCTT and SIMNET users share the same level of desire to accept no increase in realism if it meant less availability. CCTT users were significantly less likely to accept any decrease in availability if it meant an increase in realism (51% versus 45%).

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	Battalion Commanders believe VMT training best improves confidence in their training (4 on a 5 scale) and then in their units (3.75), themselves (3.63), and their equipment (2.63). 50% of Commanders would not accept a less realistic VMT for any increase in its availability while 38% would accept a less realistic VMT for a medium increase in it availability. 62% would not accept a decrease in VMT availability for any increase in its realism while 25% would accept a decrease in availability for a slight increase in realism. Commanders report the capabilities of their VMTs do not allow them to train CASEVAC, maintenance, CAS, convoy operations, MOUT, and dismounted tasks.
	Battalion commanders believe VMTs most improve their confidence in their training (3.6 on a 5 scale) followed by their unit, self, and equipment (2.66). 47% of commanders would not accept a less realistic VMT for more access. 25% would settle for a less realistic VMT for a major increase in availability. 58% of battalion commanders would not accept a decrease in availability for an increase in realism. 25% would settle for less availability for a major increase in realism. Commanders report they are unable to train logistics/sustainment, gunnery, and MOUT due to VMT limitations. Most commanders, however, said there were no tasks they could not train due to VMT limitations.

BN S3	S3s believe VMTs best improve confidence in their training followed by themselves, their units, and their equipment. 43% of S3s would not accept a less realistic VMT for any increase in availability. 28.5% would accept a less realistic VMT for a slight increase and 28.5 would accept for a medium increase in availability. 28.5% of S3s would not accept a decrease in VMT availability of any increase in realism. The same percent would accept a decrease in availability for a major increase in realism. S3s report they are unable to train dismounted tasks 92 references), logistics/sustainment, company level tasks, and weapons system maintenance tasks due to the capabilities of their VMT. One reported there are no tasks that he cannot train.
	S3s believe VMTs most improve their confidence in their training (3.88 on a 5 scale) followed by their unit (3.72), themselves (3.53), and their equipment (2.78). 50% of S3s would not accept a less realistic VMT for any increase in its availability. 33% would settle for a less realistic VMT for a medium and 8% would settle for a major increase in availability. 47% of S3s would not settle for a decrease in availability for any increase in its realism. 33% would settle for a decrease in availability for a major increase in its realism.
BN MG	Master Gunners believe VMTs most improve their confidence in their units and training (3.83 each on a 5 scale), then themselves (3.33) and their equipment (2.5). 67% of Master Gunners would not settle for a less realist VMT for any increase in its availability while 33% would settle for a major increase. 67% would not settle for a decrease in VMT availability for any increase in realism. Master Gunners say the capabilities of their VMTs prevent them from training loader tasks (2 references) followed by dismounted operations, deliberate defense, company tasks, and pre-combat inspections and checks.
	Master Gunners report that training in VMTs best improves their confidence in their training (3.89) followed by their units (3.81), themselves (3.63), and their equipment (2.74). 60% of Master Gunners report they would not accept a less realistic VMT for any improvement in availability, while 20% report they would accept one for a medium increase in availability and 13% would accept one for a slight increase. 53% of Master Gunners report they would accept no decrease in availability for any increase in realism, while 33% state they would accept a decrease for a major increase in realism. Master Gunners report that the tasks they are unable to train due to the capabilities of their systems include none (3 references) and dismounted operations (2).
CO CDR	Company Commanders believed that VMTs best improve their confidence in themselves (3.95 on a 5 scale) followed by their training (3.71), their units (3.59), and their equipment (3.12). 47% of Commanders would not accept a less realistic VMT for any increase in availability. 24% would accept a less realist VMT for a medium increase in availability. 41% of Commanders would not accept a decrease in availability for any increase in realism. 24% would accept a decrease in availability for a major and 24% would accept a decrease for a slight increase in availability. Commanders report that due to the capabilities or their VMTs, they are not able to train logistics/sustainment (3 references) followed by dismounted operations and tank/Bradley crew gunnery skills (2 each).
	Company commanders report that VMTs most improve their confidence in themselves (3.76 on a 5 scale) followed by their training (3.73), their units (3.68), and their equipment (2.69). 60% of company commanders would not settle for a less realistic VMT for any increase in its availability. 16% would settle for a less realistic VMT for a medium increase in availability. 51% of company commanders would not accept a decrease in availability for any increase in realism. 25% would accept a decrease in availability for a major increase in its realism. Commanders report the tasks they cannot do due to the capabilities of their VMT include: SASO tasks (6 references), company and above echelon tasks (6), none (5), gunnery (3), dismounted operations (3), and logistics/sustainment (3).

PLT LDR	Platoon Leaders believe training in VMTs best improves their confidence in their training (3.88 on a 5 scale) followed by themselves (3.68), their units (3.48) and their equipment (2.6). 32% of Platoon Leaders would not accept a less realistic VMT for any increase in its availability and 32% would accept a less realistic VMT for a medium increase in availability. 48% of Platoon Leaders would not accept a decrease in VMT availability for any increase in realism. Platoon Leaders state that the capabilities of their VMTs do not allow them to train logistics/sustainment and loader's tasks. The majority of Platoon Leaders state there are no tasks that they cannot train (5 references).
	Platoon leaders believe VMTs best improve confidence in themselves (3.93 on a 5 scale), followed by their training, their unit, and their equipment. 48% of platoon leaders would not accept a less realistic VMT for any increase in its availability. 22% would accept a less realistic VMT for a medium increase in availability. 52% of platoon leaders would not accept a decrease in availability for any increase in realism. 26% would accept a decrease for a major increase in realism. Platoon leaders report that the capabilities of their VMTs do not allow them to train company and higher tasks (10 references), MOUT (8), loaders tasks (80, and logistics including breakdowns (7). Ten platoon leaders reported there were no tasks they could not train on.
PLT SGT	Platoon Sergeant believe that training in VMTs best improves their confidence in their units (3.87 on a 5 scale) followed by their training 3.83), themselves (3.7), and their equipment (3). 34% would not accept a less realistic VMT for any increase in availability. 28% would accept a less realist VMT for a medium increase in availability. 45% would not accept a decrease in availability for any increase in realism. 31% would accept a decrease for a major increase in realism. Platoon Sergeants report that the capabilities of their VMTs prevent them from training dismounted operations, and logistics/sustainment (2 references each). Two Sergeants reported there are no tasks they cannot train.
	Platoon sergeants believe VMTs most improve their confidence in their training (3.59 on a 5 scale), then themselves (3.56), their unit (3.42), and their equipment (2.93). 57% of sergeants would not accept a less realistic VMT for any improvement in availability. 19% would accept a less realist VMT for a major increase in availability. 51% would not accept a decrease in availability for any increase in realism. 26% would accept a decrease in availability for a major increase in realism. The top task that platoon sergeants report they cannot train on due to their VMT capabilities is company and higher echelon tasks (22 references) followed by dismounted operations (21), and gunnery (21). Fifteen platoon sergeants reported there were no tasks they could not perform.
AC ADV	AC Advisors believe that VMTs best improve confidence in the individual then in training, the unit, and finally equipment. 40% of Advisors would not settle for a less realistic VMT for any increase in its availability. 30% would accept a decrease in realism for a medium increase in availability. 30% of AC Advisors would not accept a decrease in VMT availability for any increase in realism while 30% would accept a decrease for a major increase in realism. AC Advisors report that the capabilities of their VMTs do not allow them to train presence patrol, react to IEDs, convoy operations, gunnery, and dismounted tasks.
TADSS Facilitators/ COTA	33% of TADSS Facilitators and COTAs would not accept a less realistic VMT for any increase in availability. Those will to accept a less realist VMT for an increase in availability were divided evenly between accepting a slight, medium, or major increase. 67% of TADSS Facilitators and COTAs would not settle for a decrease in VMT availability for any increase in realism. 22% would accept a decrease for a medium increase in availability. TADSS Facilitators and COTAs say the capabilities of their VMTs do not allow them to train gunnery tasks (4 references) followed by dismounted tasks, company or higher echelon tasks, command and control, and civil-military operations.
Site Staff	Site staff report that the capabilities of their VMTs prevent training on the following: logistics/sustainment, HMMWV tasks, and dismounted tasks. Three reported that there are no tasks which their VMT cannot support.

CCTT Users	CCTT users report that training in VMTs best improves their confidence in their training and themselves (3.62) followed by their units (3.37), and their equipment (2.57). 56% of CCTT users report they would not accept a less realistic VMT for any improvement in availability, while 14% report they would accept one for a major increase in availability, 19% for a medium and 10% would accept one for a slight increase. 51% CCTT users report they would accept no decrease in availability for any increase in realism, while 26% state they would accept a decrease for a major increase in realism.
SIMNET Users	SIMNET users report that training in VMTs best improves their confidence in their training (3.83) followed by themselves (3.56), their units (3.41), and their equipment (2.75). 55% of SIMNET users report they would not accept a less realistic VMT for any improvement in availability, while 18% report they would accept one for a major increase in availability, 17% for a medium, and 9% would accept one for a slight increase. 45% of SIMNET users report they would accept no decrease in availability for any increase in realism, while 26% state they would accept a decrease for a major increase in realism.

SUBISSUE 4.4: What do users recommend for future investment of training development budget for VMT, systems?

SUBISSUE 4.4 FINDING: Users placed the highest priority for improvements to VMTs on terrain and simulator realism. When asked to provide a specific recommendation, they responded predominantly that they wanted improvements in threat depiction, followed by improvements in terrain. It is not clear from our analysis why the leading prioritized recommendation is for improvements in terrain realism while the leading specific recommendation cited was for improvements in threat depiction.

Position	Sub-Issue Finding by Position: Physical Web
BN CDR	50% of commanders would like to see improvements in terrain realism while 38% would like to see more realistic simulators and OPFOR. 12% would like to see improvements in TSPs and site staff. Commanders would like to SAF crew members for when crews are short personnel, motion, and better communications modeling.
	Commanders would most like to see resources invested in improving system realism, followed by terrain realism, support staff, TSPs and SAF. The most recommended improvement was more realistic OPFOR followed by more realistic terrain, dismounted capability, improved scenarios, urban terrain, and improved battle damage, in order.
BN S3	86% of S3s would like to see resources placed into better terrain realism. 29% would like to see more realist simulations. 14% would like to see improvements in TSPs, support staff, and HMMWV models, each. S3s would like most to see better visual weapon effects (2 references).
	S3s would most like to see resources invested in improving simulator realism (54%) followed by better support staff, better SAF/OPFOR, and better terrain realism, in order. One S3 recommended addition of coalition forces. S3s reported they would most like to see improvements made in terrain realism (8) followed by vehicle realism (4) and weapon system realism (4).
BN MG	50% of Master Gunners would invest resources into improving TSPs and terrain realism. They would improve VMTs by improving the loader's station (2 references) followed by OPFOR realism, dismounted modeling, and adding more systems.
	67% of Master Gunners would like to see resources invested in more realistic simulators while 27% would like to see better terrain realism and 20% would like to see betters TSPs and SAF/OPFOR. The improvements most referenced by Master Gunners is a more realist threat and urban terrain (3 references each) followed by better weapon system realism (2).

CO CDR	65% of Company Commanders would like to see resources committed to improving simulator realism. 41% would like to see better terrain realism. Commanders recommend improvements in first in weapon system realism (4 references) followed by OPFOR realism (3) and terrain, graphics and vehicle realism (2 each).
	Company commanders most want to see resources invested in simulator realism (55%), followed by OPFOR (33%), terrain realism (28%), support staff (20%), and TSPs (9%). The predominant improvement commanders want to see is OPFOR realism (20 references), followed by weapon system realism (10), terrain realism (8), and vehicle realism (7).
PLT LDR	77% of Platoon Leaders would like to see more realistic simulators. 36% would like to see improvements in terrain realism. Platoon Leaders recommend more realistic scenarios, better vehicle realism, and better OPFOR realism (3 references each).
	52% of platoon leaders would invest resources in more realistic simulators while 36% would invest in terrain realism, 31% in OPFOR realism, and 14% in site staff. Platoon leaders would like to see improvements made first in OPFOR realism (28 references), terrain realism (19), vehicle realism (including vehicle breakdowns and HMMWV simulators) (17) and weapon system realism (11).
PLT SGT	55% of Platoon Sergeants would like to see resources committed to better terrain realism. 52% would like to see more realistic simulators. Platoon Sergeants recommend improvements to terrain realism (8 references) followed by vehicle realism (5) and OPFOR realism (3).
	Platoon sergeants would most like to see resources invested in improving simulator realism followed by terrain realism and SAF realism. Other recommendations include buying more systems, sustaining site staff, and buying repair parts. Sergeants would like to see OPFOR/SAF realism improvements (42 references) followed by terrain/weather realism improvements (19), weapon accuracy improvement (18), vehicle realism (14), realistic scenarios (9) and better graphics (8).
AC ADV	70% of AC Advisors would like to see resources committed to improving simulator realism while 50% would like to see improvements in site staff and 40% would like to see better OPFOR. Advisors recommend better OPFOR TTP, better weapon systems realism, more realistic terrain (3 references each) and the ability to train loader's tasks (2).
TADSS Facilitators/ COTA	50% of TADSS Facilitators and COTAs would like to see resources invested in improving OPFOR realism and more realistic simulators. 30% would like to see improvements in support staff and terrain realism, while 10% would like to see improved TSPs. Specific improvements include OPFOR realism (2 references), MOUT terrain, integration of HMMWV simulators, COBs, different regional databases, and more availability.
Site Staff	66% of site staff would like to see more realistic simulators. 44% would like to see more realistic OPFOR. Site staff would recommend better graphics.

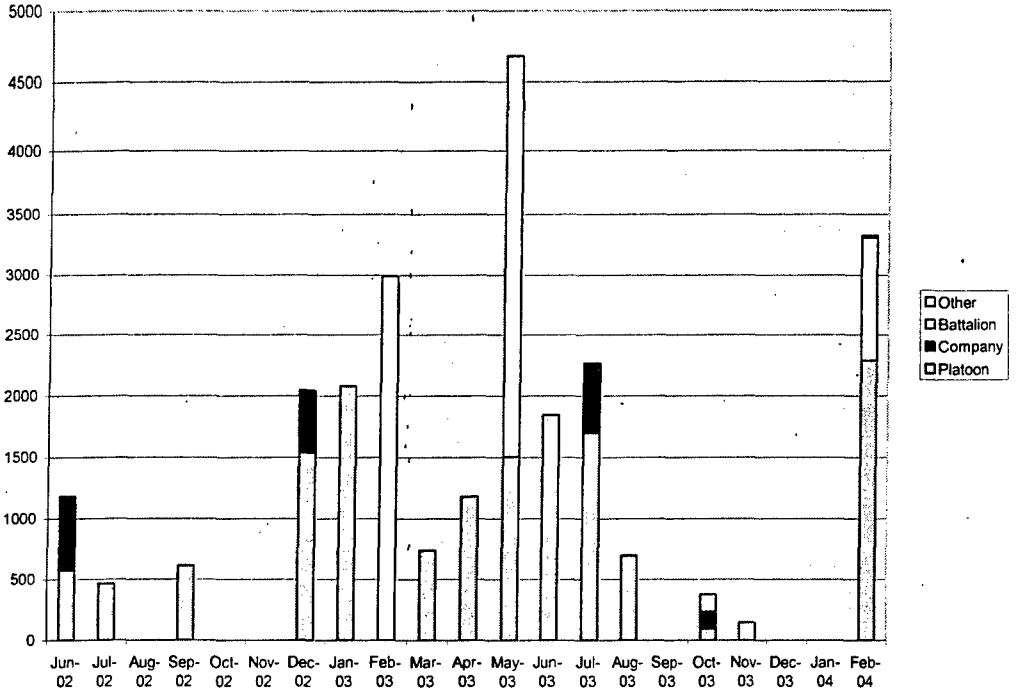

Figure 8. ARNG CCTT usage, Jun 02 - Feb 04.

The below chart shows reported ARNG CCTT usage by man-hours by echelon for the period June 2002 to February 2004. Some insights from this chart include:

- ARNG CCTT training does not occur on a regular pattern.
- ARNG CCTT use is primarily platoon level. There are two anomalies on the chart. The first is the battalion level training conducted in February 2003. This was movement to contact training attributed to the 108th CAV, the most prodigious CCTT user during this period. The second anomaly is the "other" training occurring in May 2003. This was crew and section training attributed to 2-263rd AR.

The below table shows the number of reported CCTT exercises by unit by month.

Table 6. CCTT Use by Month for Sample of ARNG Units

	J-02	J-02	A-02	S-02	O-02	N-02	D-02	J-03	F-03	M-03	A-03	M-03	J-03	J-03	A-03	S-03	O-03	N-03	D-03	J-04	F-04
108 CAV									1			1	2								2
1-101 CAV															1						
1-103 CAV																1					
1-112 AR										1	2										
1.127 AR															1		3	1			
1-147 AR										1			1		1						
1-194								1													
1-263 AR												2									
127														1							
1-94 AR	3						2	1													
2-112 AR																					2
2-142 AR		2	2																		
2-185 AR												1									
2-278 CAV												5									
4-112 AR																					1

Some insights from this table include:

- The units in this sample, on average, used CCTT one month per year. However, there are wide differences between unit use frequencies. 40% of the units in this sample conducted CCTT more than one month per year. These heavy-use units conducted CCTT training an average of 1.6 months per year. Low-use units in the sample conducted CCTT training an average of one month every two years.

- CCTT use generally occurred in clusters over four to five months.

Discussion:

ARNG units face an extreme challenge dealing with the conditions confronting RC units. Today's NGB units are trying to maintain a level of training readiness under severe time constraints. They are doing this when OIF, Transformation, and other requirements impact their ability to make long-term plans. Also, they are maintaining readiness while losing individuals, platoons and companies deploying to Iraq and southeast Europe.

It is under these conditions that they are trying to integrate a somewhat new and revolutionary training capability, VMTs, into their programs. Of the battalion commanders interviewed, only one articulated a concept where VMTs are integrated into an overall training plan, and he, being relatively new, had not yet implemented the plan,

nor promulgated it down to his subordinates. One battalion commander admitted that he did not know how to integrate VMTs into training. A few web respondents admitted the same. These Guardsmen are not receiving sufficient assistance. VMT usage guidance appears to be virtually non-existent. What guidance was reported is non-specific and of limited assistance in developing specific plans, strategies or schedules. NGB units are being left to develop their own approach to using VMTs. This is not necessarily a problem except that they have had minimal experience that helps them decide how to use available virtual simulations and no command or Army level assistance.

Despite these issues, leaders of ARNG units do appreciate the potential of virtual simulation and are seeking ways to use VMTs to better support training. Guard leaders reflect the same attitudes as found in their AC peers: a desire to see the virtual environments of their VMTs better emulate the current operational environment (COE). This includes complex, dynamic terrain and a civil populace; scenarios that support the offensive, defensive, and stability and reconstruction missions found in active theaters; and fully supporting training in the modes in which units must operate today: mechanized, motorized, and dismounted.

There are negative feelings towards training for high intensity conflict (HIC), especially from junior leaders. Junior leaders do not share their senior leaders' experiences preparing to fight Soviet tank armies. One cited negative aspect of VMT usage is a perception that HIC training takes time from "useful" training. As junior leaders advance in position and authority, VMTs will have to transform their training focus or they will be viewed as non-relevant. On a higher level, the Army will have to deal with a force that has a low intensity conflict (LIC) focus, similar to the post-Vietnam force.

The data shows a dichotomy between reports that VMTs provide access when needed and conflicting reports of a lack of VMT availability. Users recognize VMT effectiveness and therefore they want more availability. However, this "need" may be a perception based not on strict training management analysis, but rather on low expectations for VMT availability. If users start increasing their expectation of availability and building VMTs into their training plans based upon strict analysis, it is reasonable to believe "need" will rise and satisfaction with access might decrease.

An additional dichotomy in the data is the low regard of users towards VMT ability to train companies but their desire for an increase in company level VMT training relative to platoon level training. This is harder to explain, especially given regulatory guidance for the ARNG directing a focus on platoon level training during premobilization. It is possible that users have a general desire for more company level training to improve overall unit readiness. However, they have not had much experience in conducting company level training, especially when their primary experience base is VMTs comprised of four vehicle simulators suites. This limitation of the VMTs to which they have had access may cloud their perceptions of how well the technology is able support company and battalion exercises/training. These higher level exercises are hard to envision using platoon sets. With more experience, access to fixed sites, and assistance in planning to use VMTs to support company training this perception would likely change.

NGB units are also having difficulty integrating VMTs at the Soldier level. Units report significant personnel turbulence such that, in almost every VMT exercise, the crews and platoons are "new." A large portion of the limited time the units have to use a VMT site is consumed by orientation and administrative train-up. This impacts the time available for scenario iterations and AARs. Personnel turbulence also makes it difficult to field full crews and it is not easy for dispersed units, already challenged in forming and maintaining cohesive units, to move individuals around to support collective training.

Table 7. List of Recommendations

• CCTT and SIMNET Army-level managers should have access to current intelligence information that will allow them to rapidly identify and, perhaps, predict operational conditions.
• CCTT and SIMNET preparation training should occur using distance learning technology prior to arriving at the training location.
• Army-level managers should develop leadership guides on how to integrate virtual simulations into unit training programs.
• Virtual systems should include an artificial crew member capability that permits training by units short on personnel.
• Take home packets should be improved with greater audio and video feedback.
• Army-level managers should work on procedures and technology to link virtual training with live and constructive training.

The research effort within these investigations focused on assessing the effectiveness of virtual simulations to combat effectiveness. The research looked at two populations of simulation users: heavy, close-combat battalions recently returned from OIF and heavy, close-combat battalions within the ARNG. The research consisted of canvassing sample user communities using a developed survey and interview method to determine the answers to identified issues.

A synopsis of key findings is below:

- CCTT use is driven from bottom-up. Generally, there is little or no guidance from more senior headquarters. This maximizes the flexibility for subordinate leaders and their opportunity for initiative. However, some subordinate leaders are not well versed in integrating virtual simulations within their training program and they might benefit from instruction.

- Users are identifying CCTT as a gunnery training tool.

- Training in a virtual environment is not seen as a substitute for live training. When resources become available, units will opt for live training.

- Users recognize CCTT's support to training collective tasks but do not recognize support to individual tasks.

- AARs are critical to training success, though the majority of training comes during execution, as opposed to preparation or AARs. Leaders develop their AAR facilitation skills through experience.

- Users believe CCTT is adequately realistic to support training for the COE. Users would like to see more theater-specific modeling in order to use CCTT for more theater oriented training. Modeling includes theater-specific environment, missions, and threat forces.

- Users believe CCTT adequately models the Abrams tank and Bradley fighting vehicle. Users would like to see the Abrams loader station better modeled, especially the modeling of the loader's M240 machine gun. Users would also like to see realistic vehicle breakdowns to support learning to fight vehicles under less than optimum conditions.

- ARNG leaders equate their annual VMT training to 2-4 field exercises and 1-3 gunnery rotations. ARNG use of VMTs is limited by logistics, including the number of systems and transportation to VMT sites. ARNG unit leaders would like to conduct more VMT training and increase company level training.

In the process of the research, the team formulated personal and collective perceptions relative to the effectiveness and value of CCTT and SIMNET. We believe it is important to make our observations and recommendations explicit.

CCTT and SIMNET Army-level managers should have access to current intelligence information that will allow them to rapidly identify and, perhaps, predict operational conditions. This will allow Army-level managers to emulate such conditions, through software and hardware, in their system's virtual environment. Managers could also distribute information to site managers to improve scenario/exercise development. This will improve the quality of the training available to users and improve the relevance of whatever virtual trainer they use. Information available to sites should include the terrain of a likely battlespace, anticipated enemy, and potential missions. The goal would be to provide units the capability to become familiar with their area of operations (AO) and conduct missions under conditions which they might expect to encounter before deploying to that AO in a virtual environment.

CCTT and SIMNET preparation training should occur using distance learning technology prior to arriving at the training location. This would be especially beneficial for the Reserve Component. The several hours of orientation they require prior to a training event could be done before the CCTT or SIMNET training day during an earlier IDT or between IDTs. This would preserve valuable time for training, allowing more in-depth exercises and improving return on the logistical investment of co-locating virtual trainers and Soldiers.

Army-level managers should develop leadership guides on how to integrate virtual simulations into unit training programs. Multiple guides should be targeted at different leadership echelon audiences: platoon, company, battalion, and higher. As increased

weapons system capability combine with diminishing live training resources and venues, virtual training will take greater priority. Virtual system managers should help educate users and potential users on how to maximize the benefit of virtual training and how to transition from performing in a virtual (yet artificial) environment to performing in a live environment.

Virtual systems should include an artificial crew member capability that permits training by units short on personnel. Personnel turbulence is creating situations where units do not have full crews. Reassigning crewmembers to fill open seats even temporarily is detrimental to training. Also, due to the distances between NGB units, it may not be possible. In these situations, units should have the ability to replicate a loader or other crew member via software.

Take home packets should be improved with greater audio and video feedback. Leaders should be able to replay scenarios using these packets between exercises to reiterate learning points. Further, these packets should be placed in a "Lessons Learned" repository where other units can review them to learn from prior successes and failures.

Army-level managers should work on procedures and technology to link virtual training with live and constructive training. Several NGB respondents reported already doing this. Their efforts should be reviewed and improved upon. This will allow more complex training and support training of higher level commanders and staffs.

This report represents two investigations of CCTT effectiveness; they are companions to a previous investigation completed in 2003 and publicly reported in January 2004 (Mastaglio, 2004). These three investigations are similar in that they used the same data collection and analysis approach, addressed the same core basic issue – how well, from a user's perspective is CCTT meeting the training requirements of close combat heavy units, and at the overall investigation level investigated several similar issues. Therefore, we are including here a limited cross comparison of these three investigations in the interest of identifying common and consistent findings. This analysis was not performed at a detailed (question or sub-issue) level but in terms of overall findings. Table 7 below compares similar or related findings between the three investigations. Some general observations we made from this comparative analysis:

- Fixed sites schedules are more stable and less likely to change and cause users to have to modify their plans.
- Virtual simulation is used as an important step (gate) in many units in their preparation for major live training events (e.g., NTC rotation) but it is not viewed equivalently as a key step in prep for actual combat.
- Primary focus of CCTT training is company, then platoon, level exercises at fixed sites; platoon level for mobile sites.
- AARs are viewed as a critical component of effective training in virtual collective training simulations.
- Fidelity of CCTT is acceptable to users.
- A major enhancement to both fixed and mobile CCTT desired by users is more HMMWV simulators.

- In general, there is not higher level command guidance or published directives prescribing use of CCTT at any specific level on a calendar-basis or to train any specific tasks or events.

Table 8. Study Finding Cross-Comparison

CCTT Study	OIF Study	ARNG Study
CCTT sites are being operated in accordance with established policies, and users find them conducive to achieving effective training	Sites were operated to support unique predeployment requirements. Changes were made as necessary.	Scheduling supports training needs. Sites are available to support training plans, but this could be due to lower user expectations. Scheduling turbulence sufficient to change training plans was reported by one-third of users.
Users assess CCTT as having a direct positive impact on their combat readiness. Units consistently include CCTT training in their preparation for live training events and believe its use directly improves METL performance levels. Opnions vary by unit and grade as to whether key staff and chain-of-command oversight of the preparation for and execution of CCTT training exercises is sufficient	Users found CCTT useful during predeployment. However, due to predeployment specific training focuses and availability of live training, CCTT was neither essential to training nor written into training plans.	Users report VMTs are valuable. However, due to system non-availability, logistics/transportation issues, and unfamiliarity with VMTs, users have not integrated them into their training strategies.
CCTT is being integrated into unit training strategies and plans as a key event, but is not given the same emphasis or as closely managed as field training.	CCTT was not integrated into predeployment training strategies. There was no prescriptive use of CCTT for training. USAREUR did prescribe CCTT training/certification. This was done at the division as opposed to battalion or brigade.	Units consider VMTs to be add-ons to training strategy, often to prepare for live training. Battalions, companies, and platoons have received no usage guidance.
Company grade officers and NCOs are the prime users of CCTT, both because that is the way it is generally managed at the battalion level and because they have easy access to the site for their unit's use.	Company grade users were generally the sole users of CCTT.	VMT training is done primarily at platoon level but is planned at battalion level.
Close Combat unit leaders believe CCTT directly contributes to unit readiness and potentially reduces resource consumption. However, it is not feasible to develop specific metrics for value or cost effectiveness	Leaders believed CCTT contributed to training. They believed CCTT must better model COE conditions, friendly task organization, and missions.	Leaders state VMTs contribute to unit training. However, they require additional education/experience to be able to fully integrate them into training programs. They believed VMTs must better model COE conditions, friendly task organization, and missions.

All members of the chain-of-command rated the AAR capabilities in CCTT as critical to effective training.	Leaders state AARs are critical to CCTT effectiveness.	Leaders state AARs are critical to VMT effectiveness. AARs provide about one-third of total VMT training. Users and AC Advisors state AARs are somewhat effective, while administrators report higher effectiveness. Better trained facilitation is key to improving AARs.
CCTT is being used at the company and platoon level extensively to prepare units for live fire table ranges.	CCTT was used at the company and platoon level.	VMTs are used mostly at the platoon level. Users want to see increase in proportion of company level training. VMTs are used primarily for maneuver training but also gunnery and leaders training. Company and platoon level leaders see more gunnery value in VMTs than battalion level leaders.
Users are satisfied with the fidelity of CCTT	Users are satisfied with the fidelity of CCTT. They would like to see better modeling of COE.	Users are satisfied with the fidelity of VMTs. They would like to see better modeling of COE.
Users noted or recommended system level improvements to CCTT in two major areas: more simulators at each site and HMMWV models	Users believe CCTT must better model COE conditions, friendly task organization, and missions. Users want HMMWV models to support motorized operations.	Users believe VMTs must better model COE conditions, friendly task organization, and missions. Users want more simulators and HMMWV models to support motorized operations.
Users rate CCTT as able to provide positive transfer to improved performance in both combat and during field exercises.	Same	Same
There is no published training guidance at any level establishing usage levels or event-driven use of CCTT.	Same	Same
The Commanders Integrated Training Tool (CITT) was developed to assist junior leaders plan and execute CCTT training. CITT is available at fixed sites, but most company grade officers are not aware of it.	NA	Leaders are not familiar with TSPs. Scenarios are developed by units with site staff support.
CCTT provides small unit leaders not only a training context to prepare for specific upcoming events and an environment in which to execute and train to standard on their unit METL but also an assessment environment in which they can determine what unit missions, tasks, METL or skills need remediation.	NA	Users have not fully integrated VMTs into training strategies, due most likely to lack of system availability and inexperience with VMTs. Leaders are designating training objectives but these are often unspecific and training is not being modified to reach objectives. VMTs are not being used to assess training not training proficiency.

References

Mastaglio, T.W., Peterson, P., & Williams, S. (2004). *Assessing the Effectiveness of the Close Combat Tactical Trainer* (Research Report 1820). Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences.

Russel, T.J, Seventh Army Training Command, After Action Review (AAR), Headquarters (2003). *Two-Minute Drill (2MD).*

Schonlau, M.., Fricker, R.D., Jr., & Elliott, M.N. (2002) *Conducting Research Surveys Via E-Mail and the Web*: Rand.

United States Army Forces Command. (1999). *FORSCOM/ARNG/USAR Regulation, 350-352.*

Appendix A: USAREUR Questions and Consensus Answers

QUESTION	CONSENSUS ANSWER
1. Prior to notification, how did units schedule CCTT?	USAREUR units used the Training Resource Management System to schedule CCTT Training. The level at which the scheduling is done varies by unit
2. Describe a typical, non-2MD CCTT training event?	USAREUR units typically use CCTT for one day training exercises, primarily at platoon level with some company events. Multiple iterations of the same or several different scenarios are completed with AAR after each mission. Company commanders are the primary trainer using the system
3. What was the relationship between CCTT and live training?	CCTT is used in USAREUR normal training as a preparatory event for CMTC rotation.
4. What was the relationship between the 2MD and a unit's METL?	The tasks trained in the CCTT 2MD were generic and identical for all units.
5. What was the strategy/objectives of pre-deployment training/certification?	Final training of crews and platoons prior to going into combat. Insure all units met a minimal level of proficiency
6. What role did live training have in this strategy?	There was no live maneuver training in 2MD except for range tables. It primarily was gunnery and virtual collective training
7. What role did the 2MD have in this strategy?	2MD was the overall strategy, CCTT portion was designed to exercise C2 and maneuver at platoon level.
8. Did units use CCTT outside of the 2MD and, if so, how did they use it?	Some units used CCTT to prepare for deployment prior to it being dedicated to 2MD structured training.
9. How did the 2MD impact non-deploying units, especially in scheduling? No access.	Non deploying units were not able to use the site during 2MD training period.
10. Was sufficient time available to conduct the 2MD, AARs, and re-do's, if necessary?	Yes, approach to organizing 2MD training allowed units sufficient time to achieve training objectives.
11. Did prescriptive training create economies of use?	Yes, better use was made of the facility and it was used more efficiently -- enhanced throughput.
12. What changes to site operations were made to accommodate the 2MD? Significantly increased cost.	Site operated 24/7 with 12 hour shifts during 2MD, augmentation staff came from US.
13. How did BN/CO CDRs perceive the impact of prescriptive training on their training management/success?	Commanders at Co and Battalion levels were appreciative and supportive of 2MD CCTT Training. No negative responses to a prescriptive approach.
14. Was the 2MD a test of a training event? Training event.	The 2MD was primarily viewed as a training event that units had to complete successfully to insure readiness for combat operations.
15. How did units perceive the 2MD? Did they view it as a test or an aide? Did their perception change once training was complete?	Soldiers viewed the 2MD positively with minimal complaints.
16. How did the 2MD impact other Pre-Deployment training?	The CCTT portion of the 2MD was not interdependent upon any other training events.
17. Did the 2MD include the option of a "do-over?" Who made that decision? What remedial training opportunity was there prior to the "do-over?"	Units were required to re do scenarios which they did not complete successfully based on the assessment of the CMTC Observer/Controller managing the training.
18. Why was the use of 2MD stopped as a (prescriptive) pre-deployment event?	2MD was a one-time event to prepare 1st AD for combat because of limited time to get ready.
19. What tasks were part of the 2MD and how were they selected? Collective? Leader? Individual?	CCTT portion of 2MD trained collective tasks select by the command to support expected mounted combat operations in Iraq.
20. How were task-conditions-standards selected and was this more efficient/effective than decentralized selection? Why?	The Observer/Controllers established the standard to which platoons had to perform the selected tasks
21. What linkages were there between the 2MD and live training? Were 2MD results/observations built into live training?	There were no linkages between live training events, essentially ranges, that were also part of 2MD.
22. Did the 2MD incorporate Leader, Individual, and	

23. What was the impact of 2MD on unit "Directed Mission" METL development?	Not able to determine from responses.
24. What echelon conducted the 2MD?	PLATOON
25. What was the role of the two higher echelons?	Co and Battalion Commanders and Staff observed training on an individual discretionary level but did not play a role in the training event per se.
26. How were AARs conducted? Who facilitated them?	The Observer/Controllers conducted the After Action Reviews using a common template generally after a mission was completed successfully
27. How was the OPFOR depicted/played?	OPFOR was templated by CMTC S2 based on info about Iraqi Army and controlled by Site Staff during execution of scenarios.
28. How was the terrain database used in the 2MD?	NTC
29. What feedback on accuracy/effectiveness was received from live-training venue? OPFOR? Conditions? Tasks/Missions?	There was not any cross talk between training events comprising the 2MD (e.g., between live ranges and CCTT or vice versa)
30. What feedback on accuracy/effectiveness was received from live-training venue? OPFOR? Conditions? Tasks/Missions?	None
31. What changes to CCTT operations have been made due to 2MD? Administration? SAF? Training Management? AARs? TSPs?	None
32. What changes to CCTT operations have been made due to OIF feedback? Administration? SAF? Training Management? AARs? TSPs?	CCTT has added a Baghdad database and IED models for inclusion in scenarios -- no new TSPs.
33. Was fratricide-prevention built into 2MD and, if so, how?	There were opportunities for training audience to deal with fratricide but not a specific scripted fratricide event
34. Were combined arms and/or joint operations built into the 2MD and, if so, how?	Beyond integrating fires and calling for them within a scenario there was no integration of combined arms or joint operations in 2MD CCTT scenarios.
35. Were there any events built into the 2MD or other CCTT training because they could only be replicated in virtual simulation?	The ability to train on a virtual dessert landscape was critical for USAREUR units who have no training areas similar to it.

Appendix B: Web Collection Analysis

One of the goals through this series of investigations on CCTT effectiveness has been to establish the efficacy of using a web-based approach for collecting data from the user community to support analysis and subsequent findings. The web collection process is outlined in the Method section above. This appendix analyzes the efficacy of web collection.

The original concept for the approach to effectiveness assessment was based on principles and techniques applied in Customer Relationship Management (CRM) approaches used in the commercial sector. In this case, the product is CCTT and the customers are its targeted user community—close combat heavy units. One method recommended to organizations who want to implement a CRM approach is to leverage the availability of the web to gauge users' attitudes while allowing users to be anonymous. This approach has application to assessing the effectiveness of training systems (or other military products).

For the OIF Study, MYMIC offered to evaluate the potential for using the web as a data acquisition source. This was intended to be a proof of principle that would answer questions regarding how to set up the questionnaire process on the web, what methods to use to notify potential respondents, whether a significant number of targeted respondents would complete the questionnaire, and would the data be sufficient to support an analytic effort.

In order to address these issues, MYMIC created a companion survey related to the OIF investigation issues but not identical to the questions posed on the physical questionnaires. In retrospect, we should have selected a subset of the actual question used in physical data collection. Nevertheless, the web data collection test demonstrated the efficacy and potential of this as a primary tool for training effectiveness investigations. In fact, the number of respondents (see Table 2) and the quality of their input exceeded our expectations and led to a decision to better develop our web-collection toolset and use it as a key process in the subsequent ARNG investigation.

The ARNG investigation web collection leveraged our assessment in the OIF investigation that valid data from sufficient respondents could be collected via the web. The ARNG investigation shifted the emphasis of the web collection from maximizing response to maximizing value of data received; value defined by support to investigation goals and minimizing survey error.

Supporting investigation goals was insured. During the preparatory phase, as sub-issues were disaggregated down to specific questions, the questions were prepared in a form that could be delivered in by means of a web-based questionnaire. Questions were written to be as simple as possible while also providing the respondent an opportunity for initiative in answering them. These required a mixture of open (text) and closed questions, sometimes supporting the same sub-issue. It also required a level of situational awareness of ARNG conditions, in order to write questions understandable to Guard respondents. The team presented questions to the NGB for their input. The NGB also

assisted the team by having three individuals, an officer, a senior NCO, and a civilian, take beta questionnaires and provide feedback.

Dealing with survey error was more problematic. The experience with the OIF web collection allowed a much more rigorous web survey creation process, designed to minimize or respond to the four sources survey error. (Schonlau, Elliot, 2002):

- **Coverage error** occurs when some part of the population of interest cannot become part of the sample.
- **Sampling error** arises when only a subset of the target population is surveyed yet inference is made about the whole population.
- **Nonresponse error** occurs when individual respondents do not participate in any part of the survey or respondents don not answer individual questions.
- **Measurement error** arises when the respondents provide false or incomplete answers.

To limit coverage error, the team used a hybrid sampling approach, combining both convenience and probability sampling. The convenience sampling occurred by placing survey announcements onto the AKO homepage, publishing them to the survey population and beyond. Probability sampling occurred via e-mail announcements to ARNG armor and infantry leaders of appropriate rank. An unexpected and, probably, unpreventable source of coverage error derives from the inability of ARNG respondents deployed to Iraq to participate in the survey. The survey was announced to a large population of Guardsmen, a good number of them had OIF experience. The team received emails from some deployed Guardsmen stating they did not have time to complete the questionnaire.

Sampling error is limited by the breadth of the response. The investigation used a wide variety of respondents covering multiple echelons (battalion, company, and platoon), perspectives (TO&E units, advisors, administration), and various types of experience. Respondents came from a fifty-five states and territories. Sampling error could be better limited by including more questions to screen and define individual respondents.

Despite not being the focus of the collection, nonresponse error was aggressively attacked. Announcements were worded to highlight the importance of each individual's participation. Several announcements were published over the life of the collection effort. Questionnaires were constructed to encourage completion. Finally, the most critical questions were front loaded. Web survey response rates vary from 7 to 44% (Schonlau, 2002). It is difficult to identify the potential web sample of the ARNG investigation. However, AKO sent out approximately 15,600 emails. With 2359 web-questionnaires collected, the response rate was just over 15%.

Measurement error was limited by several means. The self-selecting nature of the investigation, combined with the general professionalism of population, helped limit sham respondents. Assurances of anonymity and affirmative questions encourage honest responses. A SME was used to screen out answers that did not follow from questions and

sham respondents. Finally, the number of respondents and the commonality of their responses provided assurance that measurement error was acceptable.

Error reductions efforts were successful and both quantity and quality of responses were higher than expected. Therefore, the team was able to place great trust in the web data, using it for analysis in combination with the physical data, each given equal credibility.

In future web based surveys, the following steps are recommended based on our experience with these two investigations.

- Develop questions that can be presented via the web as well as used in physical questionnaires and interview protocols.
- Enter questions into a common database that can also be used to capture responses and support analysis
- Create an interface that presents (extracting them from the database) appropriate questions to each respondent visiting the webpage based upon an up-front vetting process that demographically categorizes each respondent.
- Make the website available for a specific period of time
- Advertise the availability of the web questionnaire on appropriate websites and via directed emails
- As respondents answer each question, have their responses automatically entered into the common database. (Data collected physically should be manually entered into this same database)
- Use the database as the single source for the analysis process.

The following are lessons learned:

- Web collection is an effective means for obtaining data from users.
- Collection from each source (web and physical) can occur concurrently. However there may be rationale for doing first one then the other – e.g., collecting and reviewing web data first could help target interview protocols
- Screening criteria (vetting process) is critical to improving the quality of web input data. This should be carefully designed in consultation with investigation user.
- Database design is critical and must take into account how it will support the entire research process.
- Using a single database facilitates development of tools (DAI as developed for this research) that will allow analysis of large amounts of textual data. Automatic generation of statistical data can easily be incorporated into those tools.

Appendix C: Acronym List

AAR	After Action Review
AC	Active Component
AD	Armored Division
ADC	Assistant Division Commander
AKO	Army Knowledge Online
AO	Area of Operations
AR	Armor
ARI	Army Research Institute
ARNG	Army National Guard
AT	Annual Training
ATC	Army Training Command
BG	Brigadier General
BN	Battalion
BT	Bradley Table
C2	Command and Control
CALFEX	Combined Arms Live Fire Exercise
CAS	Close Air Support
CASEVAC	Casualty Evacuation
CAV	Cavalry
CCTT	Close Combat Tactical Trainer
CDR	Commander
CO	Company
COB	Civilians on the Battlefield
COE	Current Operational Environment
COTA	Commander's Operations Training Assistant
CPX	Command Post Exercise
CSAR	Combat Search and Rescue
CSM	Command Sergeant Major
DAI	Data Analysis Interface
DMOSQ	Duty Military Occupational Specialty Qualification
EOD	Explosive Ordinance Disposal
FM	Field Manual
FORSCOM	Forces Command
FTX	Field Training Exercise
GFAC	Ground Forward Air Controller
HIC	High Intensity Conflict
HMMWV	High Mobility Multi-Wheeled Vehicle
HQ	Headquarters
IC	Instructor/Controller
ID	Identify
IDT	Inactive Duty Training
IED	Improvised Explosive Device

IN	Infantry
JIM	Joint, Inter-Agency, Multinational
LDR	Leader
LIC	Low Intensity Conflict
MALA	Macro-Level Analysis
MDMP	Military Decision Making Process
MEDEVAC	Medical Evacuation
METL	Mission Essential Task List
METT-TC	Mission, Enemy. Terrain, Troops-Time, Civilians
MG	Master Gunner
MOS	Military Occupational Specialty
MOUT	Military Operations in Urban Terrain
MUTA	Modified Unit Training Assembly
NCO	Non-Commissioned Officer
NCODP	Non-Commissioned Officer Development Program
NCOES	Non-Commissioned Officers Education System
OC	Observer/Controller
OES	Officer Education System
OIF	Operation IRAQI FREEDOM
OPFOR	Opposing Forces
OPLAN	Operations Plan
OPTEMPO	Operation Tempo
PLT	Platoon
POV	Privately Owned Vehicle
RC	Reserve Component
ROE	Rules of Engagement
RPG	Rocket Propelled Grenade
S3	Operations Officer
SAF	Semi-Automated Force
SARO	Stability and Reconstruction Operations
SASO	Stability and Support Operations
SGT	Sergeant
SIMNET	Simulation Network
SME	Subject Matter Expert
SOP	Standard Operating Procedure
STX	Situational Training Exercise
SUV	Sports Utility Vehicle
TADSS	Training Aides, Devices, Simulators, and Simulations
TLP	Troop Leading Procedures
TO&E	Table of Organization and Equipment
TPIO-Virtual	TRADOC Program Integration Office-Virtual
TRADOC	Training and Doctrine Command
TRP	Troop
TSP	Training Support Package
TT	Tank Table